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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano, H. M. Bearse, and H. Beasley, Assistant Editors

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5/31/68

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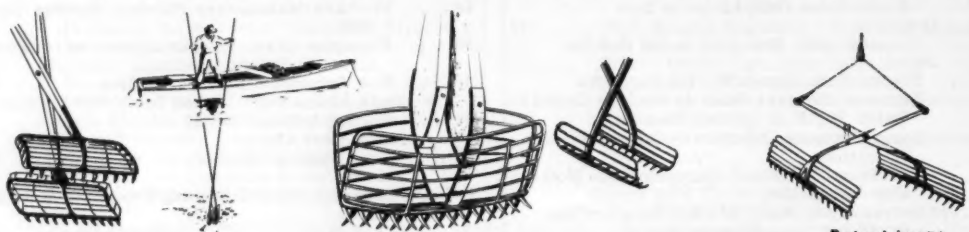
TONGS

Hand tongs are actually a pair of rakes attached to the end of two long poles (up to twenty feet in length) which are fastened together like a pair of scissors, with the fulcrum near the lower end. A basketlike frame is attached to the back side of each rake in order to hold the catch. Patent tons are a modification of the regular hand tons. They are used mainly in the Chesapeake Bay area for oysters which are in water too deep for hand tongs.



Hand tongs

Patent tongs

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NET-WEIGHT DETERMINATION FOR FROZEN GLAZED FISH

By Max Patashnik*

ABSTRACT

A procedure is recommended for determining the net weight of frozen glazed fish (large-size units such as halibut fletches and whole dressed fish). The accuracy and applicability of the procedure are discussed.

INTRODUCTION

Requests for a recommended method to determine the net weight of frozen glazed fish such as salmon and halibut steaks, halibut fletches (the entire fillet or its cross-cut chunks), and whole dressed fish have been received periodically by the U. S. Bureau of Commercial Fisheries Seattle Technological Laboratory. Since the publication of the article, "Accuracy of Net-Weight Determination for Frozen Glazed Halibut Steaks" (Patashnik 1962), the question of the applicability of the halibut-steak method to large-size units such as halibut fletches and whole dressed fish has arisen.

In the marketing of frozen glazed halibut and salmon, the need for a referee procedure to establish net weight (in the absence of an official procedure) is becoming increasingly apparent. Since it is not economically practical to apply a precisely controlled level of percentage glaze, we find considerable variation in percentage glaze on individual fish. In 1957, for example, the percentage glaze on individual halibut fletches, observed as part of an industry survey, varied from a low of 2.5 to a high of 14.9 percent. We might expect even more extreme variation in the percentage glaze of whole dressed fish because of the possibility of filling or not filling voids in the belly cavity. Thus, since net weights are usually designated for fish after glazing (based on weighing the glazed fish), they can only be regarded as an estimate of the true net weight. Therefore, to arrive at a fair designation of weight for a given lot of frozen glazed fish, we must adequately sample the entire lot and establish an average percentage glaze for the lot, the latter being established by employing the interim procedure presented below. The net weight of the lot can be calculated on the basis of this average percentage glaze.1/

The purpose of this article is (1) to recommend an interim procedure for determining the net weight and percentage glaze of frozen glazed fish--including halibut fletches and whole dressed fish; (2) to present typical data on the accuracy of the procedure; and (3) to discuss briefly various aspects of the procedure.

RECOMMENDED INTERIM PROCEDURE

The recommended procedure outlined on page 2 for the determination of net weight and percentage glaze is based on the official method given in the current U. S. Standards for Grades of Frozen Halibut Steaks (March 1959). The procedure is as follows:

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1/U. S. Department of the Interior Bureau of Commercial Fisheries trained inspectors are available on a nominal fee basis, as a service to processors and buyers of frozen glazed fishery products, to apply and interpret officially this procedure, and thus assure fair dealing to contractual parties.

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1. Weigh the fish with the glaze intact, to determine the gross weight (C in formula I).

2. Thaw the glaze from the fish as follows:

   a. Rapidly remove all excessive ice layers or pockets of ice with running tap water or a nozzle-type spray. Where the belly walls of dressed fish are frozen together, continue thawing until the ice pockets in the belly cavity are completely removed. (The use of 50° to 60° F. tap water is usually satisfactory. For the rapid removal of deeply recessed ice pockets, however, the use of about 100° to 110° F. water is preferable.)

   b. Adequately thaw the remaining outer surfaces of the frozen fish by means of water spray or water immersion to prevent the freezing of water thereon during step 4 below. Continue thawing until no residual ice glaze can be visually observed or can be sensed by finger touch. (Usually 2 to 5 minutes of thawing with 50° to 60° F. tap water are adequate, but additional time may be needed for larger fish. Neither the exact thawing time used nor the slight overthawing of the fish surface are critical factors in this determination. However, when the relatively heavy halibut fletches are being thawed, it is important to limit the thawing to a very thin surface layer to avoid significant errors during the handling in steps 3 and 4 below.)

3. Place the deglazed fish in an inclined position for about 1 minute to permit most of the excess surface water to drain away freely.

Demonstrating the use of a nozzle-type spray for reaching inaccessible ice pockets.

4. Gently wipe off all remaining excess water from the slightly thawed surfaces of the fish with a water-saturated paper towel, periodically squeezing out the excess water from the towel. Gently wipe the entire surface at least once but not more than twice. If the fish starts to ice up before step 4 can be completed, repeat step 2 as required. (Use of the water-saturated towel avoids the blotting action of a dry towel. The proper and adequate removal of the surface water as directed in step 4 is the critical part of the procedure.)

5. Weigh the deglazed fish to determine the apparent net weight (D in formula I).

6. Calculate the percentage glaze as:

$$\frac{C - D}{D} \times 100 = \text{percentage glaze} \quad \text{(Formula I)}$$

7. The net weight is represented as the difference between the gross weight with glaze on and the apparent net weight with glaze removed by this procedure.

ACCURACY OF PROCEDURE

EXPERIMENTAL: To test the accuracy of the procedure, we prepared glaze-free frozen halibut fletches, dressed halibut, and pink salmon of true net weight, T (formula II, p. 3), and glazed them. (The true net weight initially established was assumed to remain the same for all tests.) The glaze was then removed by the recommended procedure, and the fish were reweighed to give the apparent net weight, D. The difference in weight, D - T, was considered

to be the error in the method. The percentage error in the determination of true net weight was calculated as follows:

$$\frac{D - T}{T} \times 100 = \text{percentage error} \qquad \text{(Formula II)}$$

RESULTS: The following three series of tests--series A, B, and C--show the accuracy obtained in using the recommended procedure:

Series A: In the first series of tests, a single, dressed pink salmon (6 pounds, 3 ounces) was put through 11 cycles of glazing and deglazing over a 3-day period, being returned to -20° F. after each glazing and deglazing. The results (table 1) show that the error in net weight was not greater than 1.0 percent. No obvious differences in the accuracy of the method was noted whether the dressed salmon was deglazed by water spray or by water immersion. Neither the amount of glaze applied nor the length of time the fish was immersed in water noticeably affected the accuracy of the procedure, provided that the time was sufficient to remove the glaze.

Table 1 - Error in the Determination of True Net Weight for a Dressed Pink Salmon (6 pounds, 3 ounces) Subjected to 11 Cycles of Glazing and Deglazing

Test Cycle	Deglazing Time	Amount of Glaze Applied	Deglazing Error for:	
			Water Spray	Water Immersion
Number	Minutes	Percent	Percent	Percent
1	2-4	8.2	+0.2	
2	2-4	4.8	+0.1	
3	2-4	9.0	+0.2	
4	2-4	12.2	+0.2	
5	2-4	6.2	+0.2	
6	2-4	3.8	+0.0	
7	2	3.5		1/+1.0
8	5	4.6		+0.4
9	10	3.0		+0.5
10	30	3.7		+0.3
11	60	6.0		+0.4

1/The 2-minute thawing time was inadequate, as some ice glaze still remained in the visceral cavity.

Series B: In the second series of tests, a dressed halibut (21 pounds, 9.8 ounces) was put through eight cycles of glazing and deglazing as above. The results (table 2) showed that the percentage error in true net weight was within 1.0 percent for both deglazing by water spray or by water immersion for all time-intervals employed.

Table 2 - Error in the Determination of True Net Weight for a Dressed Halibut (21 pounds, 9.8 ounces) Subjected to 8 Cycles of Glazing and Deglazing

Test Cycle	Deglazing Time	Amount of Glaze Applied	Deglazing Error for:	
			Water Spray	Water Immersion
Number	Minutes	Percent	Percent	Percent
1	8	2.6	+0.5	
2	5	1.9	+0.3	
3	5	2.6	+0.3	
4	5	3.2	-0.2	
5	5	3.1		-0.1
6	10	3.8		-0.1
7	30	3.4		0.0
8	60	3.1		+0.3

Series C: In the third series of tests, three halibut fletches (3 pounds, 1.7 ounces; 7 pounds, 1.8 ounces; and 11 pounds, 0.3 ounces) were put through nine cycles of glazing and deglazing in a manner similar to series A. The results (table 3) were within 1.0 percent of true net weight. However, more variability was noted on duplicate tests of fletches that were excessively thawed; these are among the 60-minute water-immersion tests in the table.

When the fletches were deglazed for 10 minutes or more, they began to present a

Table 3 - Error in the Determination of True Net Weight of Three Halibut Fletches Subjected to 9 Cycles of Glazing and Deglazing

Type of Deglaze	Test Cycle	Deglazing Time	Amount of Glaze On:	Error in Net Weight for:	Amount of Glaze On:	Error in Net Weight for:	Amount of Glaze On:	Error in Net Weight for:
			Fletch #1 (3.1 lbs.)		Fletch #2 (7.1 lbs.)		Fletch #3 (11.0 lbs.)	
	No.	Minutes	Percent	Percent	Percent	Percent	Percent	Percent
Water Spray	1	1/1.5-2.5	4.3	-0.4	3.5	+0.1	2.5	+0.2
	2	1/1.5-2.5	3.0	-0.1	3.5	+0.1	2.9	+0.1
	3	1/1.5-2.5	3.6	-0.4	3.3	+0.1	3.5	-0.1
	4	1/1.5-2.5	3.4	-0.1	4.1	+0.1	3.9	+0.1
Water Immersion	5	5	4.0	-0.4	4.0	+0.2	3.6	-0.1
	6	10	4.8	-0.5	4.4	+0.2	3.4	-0.1
	7	10	4.0	-0.7	5.7	-0.2	4.4	-0.2
	8	60	2.6	+0.6	4.2	+0.5	4.7	-0.8
	9	60	3.6	-0.4	4.7	-0.1	4.4	-0.3

1/For adequate delgazing, fletch #1 required 1½ minutes, fletch #2 about 2 minutes, and fletch #3 about 2½ minutes.

problem because of overthawing. Owing to the relatively greater weight of the fletches, it was difficult to wipe off the excess surface moisture gently without squeezing out water from the readily compressible, thawed outer shell.

DISCUSSION OF PROCEDURE

According to the data presented, the average net weight of frozen glazed fish can be determined within 1 percent, whether the procedure is applied to large units such as halibut fletches, dressed halibut, and dressed salmon (tables 1, 2, and 3) or to small units such as halibut steaks (Patashnik 1962). In the development and use of the procedure presented, however, some background considerations should be mentioned.

Since it has previously been demonstrated that the average net weight of small units of fish such as halibut steaks (which have a high surface-area-to-weight ratio) can be determined within 1 percent, it was reasoned that the same determination applied to such larger units of fish as fletches and dressed fish (which have a relatively low surface-area-to-weight ratio) should also give results within this level of accuracy. We would expect this conclusion to be true, provided (1) that the larger fish units could be sufficiently thawed on the surface to avoid any significant refreezing of water and (2) that there was no significant loss of natural fluids during thawing and subsequent handling. Although we found this to be true with such small units as halibut steaks even when completely thawed (Patashnik 1962), it was not invariably true with all the large units in the current study. Thus, if we substantially thawed large units of fish such as dressed salmon or halibut by immersing them in running tap water at 50° to 60° F. for 30 or 60 minutes, we obtained individual test values well within 1.0 percent (tables 1 and 2). However, we began to approach the level of 1.0-percent accuracy when the longer thawing time of 10 or 60 minutes was applied to halibut fletches (table 3). In general, we observed that the thawing of halibut fletches for 10 minutes or longer presented a problem, since it was difficult to wipe off the excess water gently (step 4 in the procedure) enough to avoid squeezing out natural fluids from the readily compressible or sponge-like thawed outer surface. This difficulty resulted from the concentration of pressure at localized surface areas where the fletches came into contact with the hands or the draining surface (during step 3 and 4), because of their relatively heavy weight. Because the skin of dressed fish prevents the squeezing out of the natural fluids, they present no such problem; thus greater flexibility in thawing time is permitted.

Although thawing times beyond 5 or 10 minutes are usually not recommended, thawing up to 60 minutes was carried out in order to estimate the effect of substantial overthawing on the accuracy of the procedure. On the basis of the data in tables 1, 2, and 3, we may conclude that a slight overthawing of the fish surface as provided in step 2 of the procedure will not introduce significant errors.

The main problem in determining the net weight of large units of glazed fish (whole dressed fish) is to achieve a complete removal of the ice pockets in the belly cavity or in other hidden recesses. This can be most speedily accomplished under step 2 of the procedure, by inserting a nozzle into the cavity and employing high-velocity water warmed to the specified 100° to 110° F. Where parts of these cavities or recesses are inaccessible for the complete wiping off of excess moisture (step 4), this omission has not been found to noticeably affect results.

In step 4 of the method, the caution was given that the critical part of the procedure was to "gently wipe off all excess water from the slightly thawed surfaces of the fish with a water-saturated paper towel." This precaution becomes especially critical when working with small units of cut fish (with no skin protection) such as halibut or salmon steaks because of the high ratio of surface area to weight. Attention to this detail is also important in working with halibut fletches (with no skin protection), especially with the smaller sizes such as fletch No. 1 reported in table 3. For optimum accuracy, it is especially important to avoid removing the below-the-surface natural fish fluids; thus it is desirable to avoid either vigorously sponging the fish surface with dry paper towels, or repeatedly sponging the surface with wet paper towels.

Other conditions being equal, the relative surface-area-to-weight ratio of the product determines the accuracy obtainable. Thus, to measure individual net weights within 1-percent accuracy on dressed halibut or salmon and on halibut fletches, the operator needs little training, provided the procedure is properly interpreted. In applying the procedure to halibut steaks, however, some prior practice or orientation of the operator is necessary to obtain the average 1-percent level of accuracy because of the relatively high surface-area-to-weight ratio.

The investigator recognizes the limited number of samples employed in this study. In his opinion, the 8 to 11 replications on a single sample (tables 1, 2, and 3) establish with reasonable certainty that the method itself introduces little variance. Several possible problem areas that might conceivably introduce sample variance in the results were considered but found to offer no serious problem (varying surface-area-to-weight ratio, percentage glaze, deeply recessed ice pockets, protective skin or no skin, length of deglazing time, temperature of the glazing water, and the effect of several cycles of freezing and thawing). Until the industry or some other interested group officially requests the development of an official procedure, a larger sampling to validate this recommended interim procedure more rigorously cannot be justified. The procedure as set forth appears to be adequate to serve existing needs.

CONCLUSION AND RECOMMENDATION

In a test of the interim procedure recommended here for determining the net weight of relatively large-size frozen glazed fish units, individual results with halibut fletches, dressed halibut, and salmon were within 1 percent of the true net weight.

It is recommended that interested groups evaluate this interim procedure as the basis of a future official standardized method for determining the net weight of frozen glazed fish.

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U. S. DEPARTMENT OF THE INTERIOR
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Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

MIT-UNICEF STUDIES ON THE PRODUCTION OF FISH PROTEIN CONCENTRATE FOR HUMAN CONSUMPTION

By E. R. Pariser* and E. Odland**

ABSTRACT

Specific problems relating to (1) the dehydration, defatting, and deodorizing of fresh whole fish and (2) the defatting and deodorizing of commercial fish meal were studied at the Massachusetts Institute of Technology, under the sponsorship of UNICEF in consultation with FAO. The effect of processing variables on the quality of the final product was also investigated.

INTRODUCTION

In many parts of the world where populations suffer from the effects of a serious and increasing shortage of dietary protein, vast fish resources are known to exist. Yet, in many such localities, those resources have remained virtually untapped because facilities for the conservation, storage, and distribution of fresh or processed fish are lacking.

In order that locally existing marine products can be made available as food, it has been contemplated to prepare from fish a stable product of high nutritional value that can be readily stored and transported and used as a valuable supplement to local diets. The product usefulness and stability required cannot be achieved without the removal of water to reduce bulk and weight and to minimize bacterial and enzymatic spoilage; lipids and lipid-related compounds must also be removed, since their usually highly reactive nature makes them likely to be rapidly oxidized, with the formation of flavors and odors disagreeable to most people. Apart from impairing the palatability, such oxidized products may also produce undesirable side effects, such as gastric upset.

Numerous methods for producing such a fishery product have been published or are the subject of patent applications. Most of the published work, however, appears to refer to laboratory investigations only. Comprehensive studies correlating the evaluation of biological protein quality with processing data are seldom reported.

Among procedures suggested for the preparation of fish protein concentrates, solvent-defatting and solvent-deodorizing showed promising results and so were further investigated. Processing methods based upon these operations vary mainly in the method of dehydration, choice of solvent or solvents, and conditions of extraction. In an effort to clarify the effects of these variables on the composition, protein quality, and taste- and smell-characteristics of the final product, the United Nations International Children's Emergency Fund (UNICEF), in consultation with the Food and Agriculture Organization (FAO), arranged for a study of those problems by the Department of Food Technology of the Massachusetts Institute of Technology (MIT). This study was completed in 1961. The purpose of this paper is to summarize the results.

In this summary, we report on the following: the raw material selected; the processing methods and equipment used; and the effect of the processing variables on the final product.

RAW MATERIALS SELECTED

The raw material selected for processing by different methods included: (a) various types of commercial fish meal produced on the Atlantic Coast of the United States; (b) whole fish--such as cod, haddock, pollock, mackerel, etc.--obtained fresh from Boston; (c) fish

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Fish and Wildlife Service
Sep. No. 690

meal produced from Chilean hake (merluzza) by a conventional commercial process (screw-press extraction and hot-air drying[1]); and (d) fresh frozen and degutted merluzza. Both the Chilean fish meal and the frozen fish were shipped in cold storage to Boston, where they were stored in a refrigerated warehouse.[2]

PROCESSING METHODS AND EQUIPMENT

The processing methods investigated in these studies were performed with two basic sets of equipment.

The first set of equipment consisted of a jacketed 40-liter vacuum kettle equipped with an agitator-scraper and connected to a four-stage steam-jet vacuum system. This apparatus, shown in figure 1, was used both for vacuum drying and for simultaneous dehydration and extraction procedures.

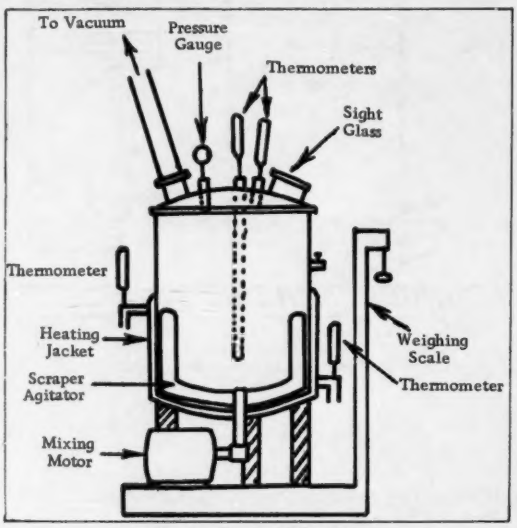


Fig. 1 - Vacuum dehydrator.

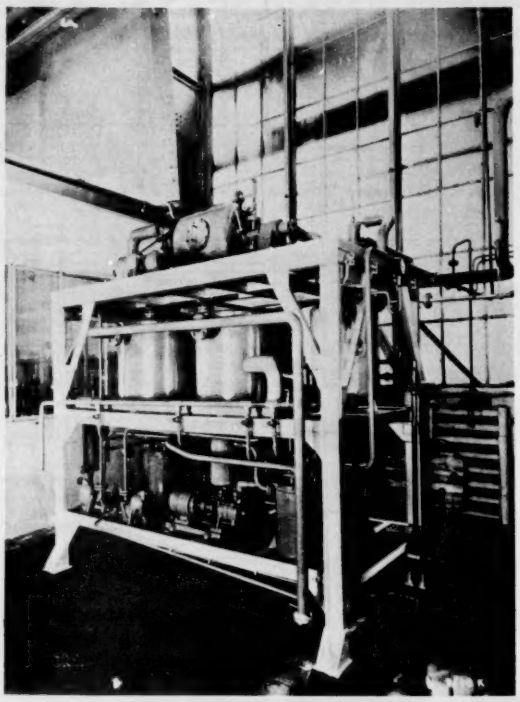


Fig. 2 - MIT-UNICEF pilot plant.

The second set of equipment was a self-contained extraction pilot plant, provided by UNICEF specifically for this study. This package was complete with tanks, pumps, motors, etc. It consisted essentially of an extraction vessel of 40-liters capacity and of equipment for solvent recovery, heating and circulation of water, and production of vacuum. This equipment is illustrated in figure 2, and a typical flow sheet is shown in figure 3. All samples of fish protein concentrate prepared and studied in this investigation were processed in this pilot plant, which was installed and operated on the premises of the Dehydrating Process Company in North Woburn, Mass.[3]

In the preparation of a fish protein concentrate, the moisture, fats, and other lipids must be removed. These components may be extracted in various ways, either separately or simultaneously. We accordingly describe the three following methods studied: (A) dehydration; (B) solvent extraction; (C) simultaneous dehydration and extraction.

1/This meal had been manufactured in the Swiss-Chilean fish meal plant, ISESA, in Quintero, Chile.

2/Thanks are due to Walter Meier, Director of the ISESA fish meal plant in Quintero, Chile, for his assistance in providing both the fish meal and the fresh frozen merluzza used in these studies.

3/Thanks are due to John Ryan for his kind cooperation and permission to operate the pilot plant on the premises of his factory, the Dehydrating Process Co.

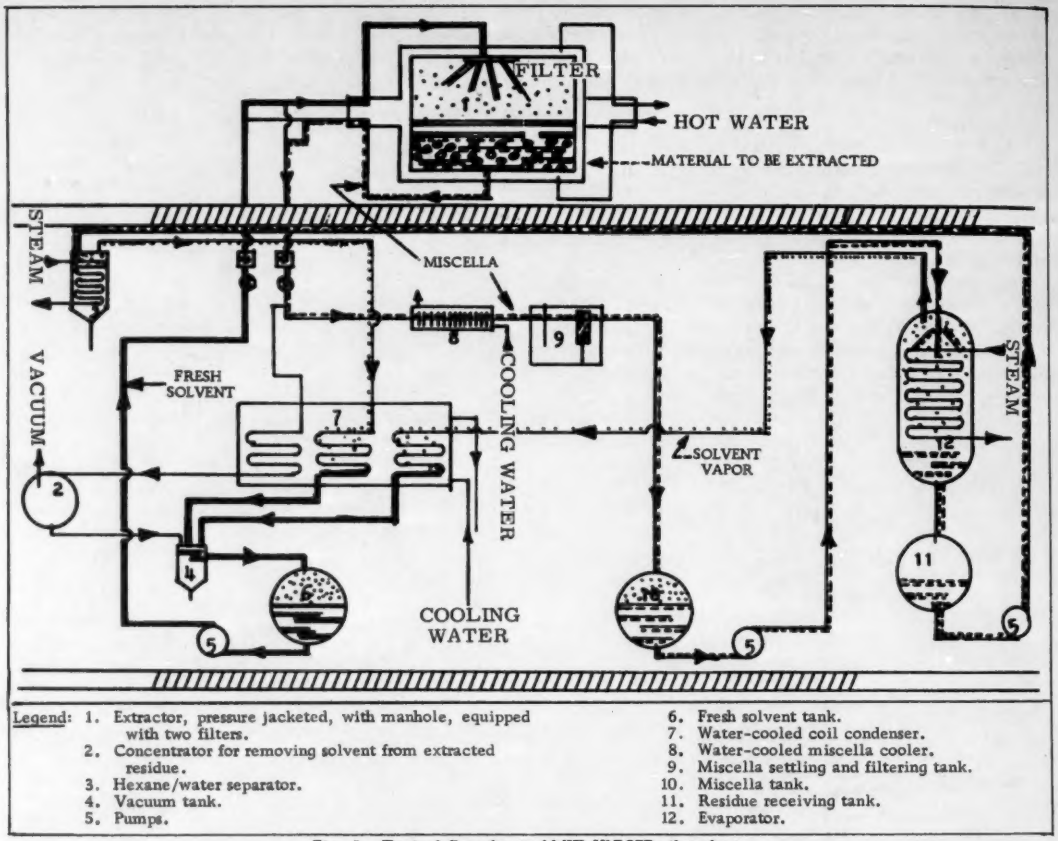


Fig. 3 - Typical flow sheet of MIT-UNICEF pilot plant.

A. DEHYDRATION METHODS: Two methods of dehydration were investigated. These were (1) vacuum drying in oil suspension and (2) drying by azeotropic distillation:

1. Vacuum Drying in Oil Suspension: PROCEDURE: In the vacuum-drying-in-oil-suspension process, the fresh-frozen and gutted fish were ground and mixed in a Rietz disintegrator with about equal weights of an edible oil. The mixture was then transferred to the vacuum kettle, and moisture was removed from the fish slurry at 40° C. (104° F.) by the application of vacuum and continuous agitation. The vacuum kettle, mounted on a platform scale, was equipped with service connections so that the rate of water removal and the dehydration end-point could be estimated. A schematic representation of the process is given in figure 4.

RESULTS: Under the experimental conditions used, the moisture content of lean fish

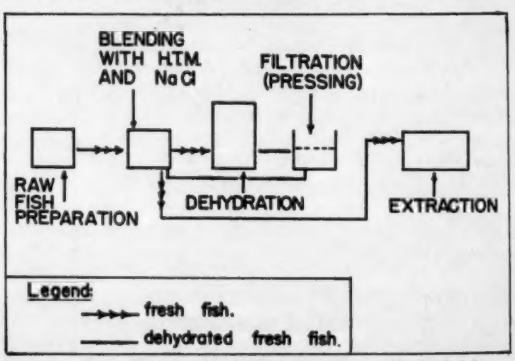


Fig. 4 - Flow diagram for the heat-transfer method of dehydration.

materials could be reduced approximately from 80 percent of the fish to 8 percent of the meal in about 1.5 hours. To reduce the moisture level of the meal from 8 percent to 4 percent usually required an additional 2.5 hours. Table 1 gives the results of some dehydration experiments in which different species of fish were used.

Table 1 - Composition of Some Lean Fish and Corresponding Meals Obtained by Vacuum Drying in Oil Suspension

Fish Species	Fresh Fish		Dehydrated Fish (Meal)	
	Moisture Content	Alcohol-Extractable Content	Moisture Content	Alcohol-Extractable Content
	(Percent)			
Haddock	79.0	3.57	5.2	0.75
Pollock	78.4	3.78	2.9	7.73
Merluzza	79.2	3.62	4.4	0.59

Experiments designed to determine the influence of the ratio of oil to fish on the rate of vacuum dehydration of comminuted fresh pollock showed that approximately equal amounts (by weight) of oil and fish gave a satisfactory rate of dehydration.

This method permits dehydration of fish at low temperatures in the absence of atmospheric oxygen, yielding a product that is of a light color and of a texture that is well suited to subsequent solvent extraction. Certain experimental problems were encountered, but on the whole, this method proved to be promising and practicable.

2. Drying by Azeotropic Distillation: PROCEDURE: For drying by azeotropic distillation, the fresh-frozen and gutted fish was ground in a Rietz disintegrator, and the slurry was transferred to the extraction vessel. The mass was slurried with 1,2-dichloroethane by means of a propeller agitator. Water at 120° C. (248° F.) was then circulated in the vessel jacket, and the moisture contained in the fish slurry was boiled off with the solvent vapor at a constant temperature of 71°-72° C. (159.8°-161.6° F.). The azeotrope was condensed, water was separated by gravity, and the solvent was recycled to the extraction chamber. The collected water was measured, which permitted the dehydration end-point to be estimated.

RESULTS: Under the experimental conditions used, the water content of merluzza was reduced from 79.2 percent to below 5 percent. The method allows dehydration in the absence of atmospheric oxygen and yields a fairly light-colored meal having a texture that is suitable for subsequent extraction.

B. SOLVENT EXTRACTION: In the processes investigated in this study, solvent extraction was used to remove lipids as well as lipid-related and odor-bearing constituents from the starting material. Except for the simultaneous dehydration and extraction method described below, all solvent extraction operations were carried out in the UNICEF pilot plant.

The following solvents or combinations of solvents were used:

1. Hexane, followed by ethyl alcohol.
2. Ethyl alcohol.
3. 1,2-dichloroethane, followed by methyl alcohol.

The extraction chamber of the pilot plant was charged with both the material to be extracted and the solvent. The kettle contents were then heated to a temperature slightly below the boiling point of the solvent, and the extraction was carried out either by a succession of batch washings, or by continuous circulation of solvent through the rotating extraction chamber.

In batch operations, the duration of a washing cycle was varied from $\frac{1}{2}$ to 1 hour. The amount of liquid retained by the meal after draining varied somewhat but usually made up between 50 and 60 percent by weight of the drained meal.

In operations involving continuous circulation of solvent, the solvent flow rate was kept constant by means of valves on the solvent-intake and -outlet lines, and with the help of a flow meter. Settling and draining were carried out as in batch operations.

After the final draining of the liquid, the remaining solvent was removed as completely as possible from the extracted meal by application of heat and vacuum and by rotation of the

vessel. By this procedure, fairly satisfactory solvent removal was usually obtained in 2.5 hours. The temperature during removal of solvent was not allowed to exceed 80° C. (176° F.).

Extraction of commercial fish meals was carried out with commercial hexane, with 95-percent ethyl alcohol, or with both in order to examine the relative efficiencies of those solvents in removing the fatty and odor-bearing components of fish. Results obtained with various commercial fish meals indicate a marked difference between hexane and ethyl alcohol in the extent to which those solvents will remove extractable matter. A quantitative examination of the respective extracts obtained indicated that hexane extracts largely oil, whereas ethyl alcohol extracts the oil as well as an appreciable amount of matter not extractable with hexane. Meals extracted with hexane were found to retain most of the fish odor, whereas the extraction with ethyl alcohol produced marked deodorization both in the meals that had previously been extracted with hexane and in the meals that had not been so extracted.

In summary, it appears (1) that extraction of fish meals with hexane alone will yield an essentially oil-free, but not deodorized product, and (2) that extraction with ethyl alcohol, or a solvent of similar properties, is required for satisfactory deodorization. Furthermore, results obtained in continuous and batch pilot-plant extractions of commercial white-fish meal with ethyl alcohol show that such extraction progresses in two distinct steps: (1) an initial washing stage in which the rate of flow of solvent controls the rate of extraction; and (2) a second stage in which diffusion of oil from within the meal particles controls the rate of extraction. For a given fish meal, the rate of diffusion was not materially affected by variations in the rate of solvent flow; and the rate of extraction in this stage was essentially a function of the length of time in which the solvent is in contact with the meal.

C. SIMULTANEOUS DEHYDRATION AND EXTRACTION: Procedure: In the method employing simultaneous dehydration and extraction, fresh-frozen and gutted fish was ground, acidified slightly, and processed at atmospheric pressure with successive batches of 95-percent ethyl alcohol in the vacuum kettle. The initial weight ratio of alcohol to wet fish was 1.5:1. In this stage, the mixture was held at 50° C. (122° F.) for 4 hours with continuous agitation. At the end of the period, the excess liquid was filtered off, and the resulting mash was reduced to about 50-percent dry solids in a hand press. The resulting press cake was disintegrated and reslurried with an equal weight of 95-percent ethyl alcohol made slightly alkaline. This mixture was held at 50° C. for 30 minutes, re-acidified, and the resulting fish solids were separated by filtration and pressing as before. After disintegration, the material was transferred to the pilot plant and extracted five times with recycled ethyl alcohol, pressed again, and further extracted with three batches of fresh 95-percent ethyl alcohol. Extraction and desolventizing were conducted as described earlier (see "Solvent Extraction"), except that the duration of each washing cycle was 1 hour; the extraction vessel was rotated for 5 minutes every 15 minutes, and the temperature of the meal during extraction was kept between 55° and 60° C. (131° and 140° F.).

Results: A dry and practically odorless product was obtained. Typical data for moisture, protein, and residual alcohol-extractable content in the finished product are presented in table 2, which gives a general summary of these studies.

This method of processing permits dehydration, defatting, and deodorizing at low temperatures, and with one solvent, while protecting the fish from atmospheric oxygen. The large amounts of alcohol required for dehydration, however, pose some recovery problems.

D. CONCLUSIONS: The dehydration and extraction experiments reported here were not exhaustive, so they can serve only to illustrate the possibility of drying and defatting fish and fish meal by the methods described. The observations do not permit a comprehensive cost analysis of the methods; in practice, costs will depend very much upon the design and engineering details of the plant chosen. Selected data on merluzza meals and protein concentrates are given in table 2 which, for comparison, also contains data for fresh-frozen gutted merluzza, commercial merluzza meal, and a lyophilized (freeze-dried) sample of fresh-frozen merluzza.

Table 2 - Composition of Fish Protein Concentrates and Meals Prepared from Chilean Hake (Merluzza) by Different Methods of Dehydration and Extraction

Sample	Moisture Content	Method of Dehydration	Solvent(s) Used for Defatting & Deodorization	Residual Alcohol Extractables (Dry Basis)	Protein (Extract-Free & Dry Basis)	
					Crude	"True" 1/
	%			%	%	%
Fresh-frozen gutted merluzza	79.2	-	-	17.5	91.4	84.5
FPC2/ from fresh-frozen gutted merluzza	4.4	Vacuum drying in oil suspension	95% ethanol	0.62	87.4	-
FPC from fresh-frozen gutted merluzza	3.8	Extraction with 95% ethanol	95% ethanol	1.0	87.0	83.3
	2.4	Azeotropic, with 1,2-dichloroethane	Methanol	0.84	84.2	74.5
Commercial merluzza meal	5.2	Cooking, screw-pressing, & hot-air drying	-	12.2	81.1	75.6
FPC from commercial merluzza meal	3.6		Hexane & 95% ethanol	0.39	76.6	-
	3.4		95% ethanol	0.56	76.2	-
Meal from fresh-frozen gutted merluzza	4.9	Lyophilization	-	17.1	85.3	83.9

1/Nitrogenous compounds precipitated by cupric hydroxide.
2/Fish protein concentrate.

EFFECT OF PROCESSING VARIABLES ON THE FINAL PRODUCT4/

PROCEDURE: The final part of these studies consisted in preparing fish protein concentrates by five different processes and evaluating the products. These concentrates were made from merluzza fish meal, commercially prepared by "ISESA," and fresh-frozen gutted merluzza. The commercial fish-meal process consists of cooking and pressing the fish, disintegrating the press cake, and drying in steam-jacketed dryers with circulation of air. Drying time is approximately 4 hours.

The frozen fish used was prepared in Chile from strictly fresh gutted merluzza, and shipped frozen to Boston. Both the meal and the frozen fish were stored in Boston at -23° C. (-9.4° F.), and portions withdrawn as needed in the experiments.

The fish protein concentrates were prepared as follows:

A. Concentrate No. 1 was prepared from the commercial meal by successive extractions with hexane and ethyl alcohol. The extractions were performed in the UNICEF pilot plant. The hexane treatment consisted of eight batch washings, each lasting 30 minutes, after which the solvent was removed from the meal. The temperature during extraction was held at 50° C. (122° F.) and during removal of solvent below 70° C. (158° F.). The hexane-extracted meal was then given nine washings with recycled ethyl alcohol, followed by three washings with fresh 95-percent ethyl alcohol, each batch requiring 1 hour. Temperature during the alcohol extraction was 55° to 60° C. (131° to 140° F.), and below 80° C. (176° F.) during solvent removal. The finished product was stored in containers at -30° C. (-22° F.) until withdrawn for testing.

B. Concentrate No. 2 was prepared in the same manner as was Concentrate No. 1 except that the extraction with hexane was omitted.

C. Concentrate No. 3 was prepared by slurrying the commercial meal with water, acidifying slightly, and allowing the mash to soak for 3 hours at room temperature. Further treatment was similar in all respects to that described under "Simultaneous Dehydration and Extraction." The finished product was then handled similarly to Concentrate No. 1.

4/Thanks are due to Frank Piskur, then Director of the Fishery Technological Laboratory, U. S. Bureau of Commercial Fisheries, College Park, Md., for the chemical and biological analyses of the processed meals and fish protein concentrates.

D. Concentrate No. 4 was made by processing the frozen merluzza as described on page 10 in "Simultaneous Dehydration and Extraction," and the finished product was again handled as in the case of Concentrate No. 1.

E. Concentrate No. 5 was prepared from frozen merluzza by first dehydrating it azeotropically in the pilot plant with 1,2-dichloroethane as described in "Drying by Azeotropic Distillation." The resulting meal was then given five batch washings with recycled methyl alcohol and three further washings with fresh methyl alcohol. Extraction, draining, and desolventization were carried out as described in "Solvent Extraction," except that the temperature during extraction was maintained at 60° C. (140° F.), and the time required for desolventization was 3.5 hours. The finished product was handled as in the case of Concentrate No. 1.

A summary of the five methods used in preparing these fish protein concentrates is given in table 2.

RESULTS: Proximate chemical analyses of the experimental fish protein concentrates and the raw materials from which they were prepared were performed, and the results indicated some interesting differences. It was found that both the frozen fish and the commercial fish meal contained appreciable amounts of nonprotein nitrogen, but that this material seemed to be removed by the processing in the case of Concentrates 3 and 4. The higher muscle-to-bone ratio in the dressed frozen fish, as compared to the whole fish used for production of the meal, resulted in a higher protein level in the former (on a dry basis) than in the latter; furthermore, the cooking and pressing involved in the meal production resulted in a loss of nitrogen.

Biological evaluations were made of the five experimental concentrates and of the commercial meal. Feeding studies were made with rats over a 4-week period using a casein diet as the control. Under the experimental conditions, rats fed the fish meal and Concentrates 1-4 showed significantly better growth and feed efficiency than rats fed casein.

All the experimental concentrates smelled faintly of fish--those prepared from commercial meal slightly more so than those prepared from frozen fish. Concentrates 4 and 5, prepared from frozen fish, were lighter in color than were the commercial fish meal and Concentrates 1, 2, and 3 prepared from this meal. Although they varied in texture, all concentrates were free-flowing in contrast to the commercial meal, which showed a tendency to cake.

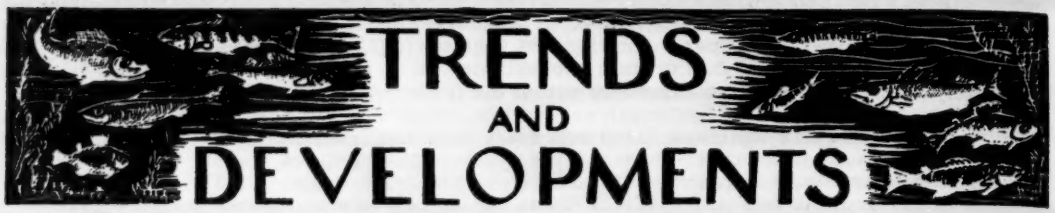
Since none of the experimental fish protein concentrates was completely odorless, all of them were incorporated into bread at two levels of concentration to permit assessment of their practical usefulness. Bread baked with the commercial meal was used as a control. Fish protein concentrate was substituted for wheat flour at the rate of 5 and 10 percent of the total amount of flour called for in the bread recipe. The breads were then judged for appearance, odor, and taste. The results of these tests can be summarized as follows: a fairly acceptable bread was obtained when 5 percent of the experimental fish protein concentrate prepared from commercial fish meal was incorporated into the bread. The same results were obtained when protein concentrate prepared from frozen fish was incorporated at the 10-percent level. Bread baked with the commercial meal itself was found unacceptable by 90 percent of the judges at the 5-percent level and by 100 percent of the judges at the 10-percent level. Bread baked with Concentrates 1, 2, and 3 was found acceptable by about 80 percent of the judges at the 5-percent level and by about 60 percent at the 10-percent level. Bread baked with Concentrates 4 and 5 was found acceptable by 89 percent at the 5-percent level, and by 85 percent of the judges at the 10-percent level. Since appearance and "feel" of a product such as bread can affect the judgment of other qualities, these results undoubtedly also reflect to some extent differences in appearance, texture, and other intangibles.

CONCLUDING REMARKS

During the work reported here, the emphasis was placed on the technical feasibility of preparing a nutritious fish protein concentrate suitable for use as an ingredient in food, and

no attempt was made to evaluate comprehensively the basic engineering requirements and the economics of any of the methods examined. A number of problems were encountered which indicated that considerable experimentation and engineering development are required before the processing technology of fish protein concentrate can be advanced on a broad basis. Unfortunately these could not be followed up within the framework of the investigation.

A PUBLIC SERVICE MESSAGE FROM THE U. S. DEPARTMENT OF THE INTERIOR AND THE U. S. DEPARTMENT OF AGRICULTURE.



Alaska

FOREIGN FISHING ACTIVITIES IN WATERS OFF ALASKA AS OF AUGUST 1963:

Soviet trawl-fishing operations in the Gulf of Alaska increased to more than 150 vessels this year. All observations by U. S. Bureau of Commercial Fisheries personnel indicate the Soviets are fishing primarily Pacific ocean perch with very little halibut or other incidental species included in the catches, according to an August 27, 1963, news release from the Bureau's Alaska Regional Office at Juneau.

Additionally, the Soviets operated three king crab fleets in the Bering Sea from March until June, when they shifted operations of two of the fleets into the Gulf of Alaska about 100 miles southeast of Kodiak Island. After fishing there briefly with excellent success, the fleets returned to waters off Siberia and engaged in the saury fishery off the Kurile Islands.

Four Soviet whale fleets have operated intermittently in waters off Alaska during the summer. The swift whale killer vessels have been reported in violation of Alaska territorial waters several times in pursuit of whales. The four whaling fleets constitute the largest Russian whaling effort in the North Pacific and Gulf of Alaska to data.

The total Japanese fishing effort in the eastern North Pacific is somewhat reduced from last year. In 1962 the Japanese in the eastern Bering Sea operated four factoryships and an estimated 112 trawlers, catching fish for reduction and processing fish meal and oil. It is believed that dwindling catches and high costs of operation have caused the Japanese to reduce the fish-meal operation to the August level of a single factoryship and 30 trawlers.

The Japanese shrimp operations in 1962 consisted of three factoryships and 38 trawlers operating within a radius of 100 miles of the Pribilof Islands. The three fleets took almost 40 million pounds of shrimp. In 1963, two shrimp factoryships and 26 trawlers returned to the same general area north of the Pribilofs and are enjoying excellent shrimp fishing.

A Japanese king crab fishery has operated for the past several years in the eastern Bering Sea off Port Moller. Efforts in 1963 were reduced to two factoryships accompanied by four trawl-type tangle-net setting vessels. Last year, the Japanese operated four factoryships and 19 trawler-type vessels. A proposal to shift king-crab operations to the Gulf of Alaska apparently has been abandoned by the Japanese this year.

Whaling activity in 1963 by the Japanese remained at the same level as last year. Three factoryships, each accompanied by seven killer vessels, operated in waters off Alaska. One fleet remained in the western Aleutian area throughout the season. However, the other two fleets moved south and east as far as the vicinity of Prince of Wales Island, representing the farthest south and east penetration of any large foreign fleets to date. Like the Russians, the Japanese whale killers have been reported in violation of the three-mile territorial sea limit on a number of instances.

The 1963 fishing season has marked a new high in patrol efforts of the U. S. Coast Guard and U. S. Bureau of Commercial Fisheries in waters adjacent to Alaska. Joint Coast Guard and Bureau enforcement responsibilities for several International Treaties coupled with increasing foreign fishing activities in waters off Alaska have prompted a substantial increase in patrol and surveillance efforts over previous years.

* * * * *

BRISTOL BAY SALMON SEASON:

Bristol Bay with a catch of 2.5 million red salmon during the 1963 season experienced the lowest catch ever recorded for that area, according to a July 1963 report. The previous low was in 1958, when the catch totaled 2.9 million fish. The escapement for the entire Bristol Bay area was estimated at 3.2 million reds for a total run of approximately 5.7 million fish. The run produced 203,700 cases of canned salmon as compared to 926,400 cases in 1961 (the largest pack during the last 10 years).

The salmon fishing industry in Bristol Bay supports practically the entire economy of the villages of Dillingham, Naknek, King Salmon, and others. Approximately 3,500 persons are affected. Alaska's Governor and congressional delegation asked the President to declare Bristol Bay a disaster area. The U. S. Department of the Interior has instructed the Alaska Field Committee to cooperate with the State in exploring means of helping the people of the area.

* * * * *

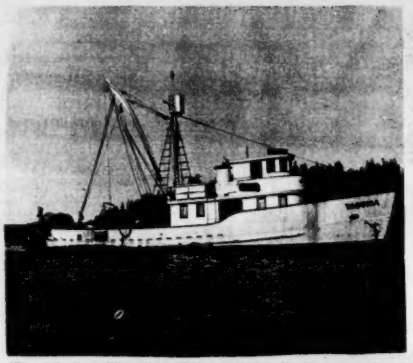
KODIAK FISHERIES:

The Kodiak area at the end of July 1963 was about to break production records again. The catch of king crab for the 1962/63 season (July 1-June 30) totaled 36,793,000 pounds as compared with the 1961/62 total of 28,649,000 pounds. The Dungeness crab catch last fiscal year was reported to have totaled 545,800 pounds, about the same as the previous year. The razor clam catch this season was up 100,000 pounds over last year with a total of 424,000 pounds reported.

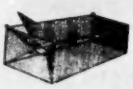
Alaska Exploratory Fishery Program

M/V "YAQUINA" BEGINS SHRIMP EXPLORATIONS:

The M/V Yaquina is under charter to the U. S. Bureau of Commercial Fisheries for the second consecutive year for exploratory fishing in the Gulf of Alaska. Primary emphasis during the 1963 season is to be on shrimp explorations in the North Central Gulf of Alaska. One cruise started operations in the Montague Island (Prince William Sound) area. Through July 1963, trawling was carried on westward to Nuka Bay (near Seward). Shrimp were not taken in commercial amounts at any of the areas fished. Results of test fishing to that date indicated a widespread dispersal of side-stripe and pink shrimp with neither species evident in dense concentrations at any location sampled. The Seward-based commercial shrimp vessels continued to take large catches (60,000-100,000 pounds) during short trips to Kodiak Island. The Yaquina was expected to continue working to the westward with port calls scheduled for Seldovia and Kodiak during August 1963.



The 75-foot Yaquina chartered by the Bureau of Commercial Fisheries to conduct exploratory fishing surveys in Alaskan waters.



Alaska Fisheries Investigations

NAKNEK RED SALMON SMOLTS HIGHEST ON RECORD:

About 14.5 million red salmon smolts left the Naknek River by July 23, 1963, constituting the greatest number since the smolt enumeration project started eight years ago, according to the U. S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory. The two-check fish produced from the 1960-brood spawning escapement constituted 64 percent of this year's smolt migration. Only 35 percent were one-check fish from the 1961 escapement. This is the first time that the two-check smolts have been in greater numbers than the one-check fish for the Naknek system. The Karluk red smolt migration was about 1,540,000 fish, or about the same as for the previous two years. The Ugashik outmigration is estimated to have been 33 million smolts. The production from the large escapement of 1960 (2.3 million adults) now totals 30 million smolts.

* * * * *

AUKE LAKE ADULT RED SALMON RUN GOOD:

The 1963 Auke Lake spawning escapement of red salmon is about 6,400 fish with almost half of them being females. This large return to such a small lake (100 acres) supports the high but very gross estimate of 90,000 smolts leaving Auke Lake in 1961. These few years of salmon population statistics for Auke Lake are encouraging insofar as using the system for research.

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SALT-WATER TEMPERATURES AFFECT PINK SALMON GROWTH:

Growth rates of captive juvenile pink salmon in Auke Bay were much different in July 1963 than in July 1962. In 1962, growth declined after early June, corresponding with rising salt-water temperature. In 1963, water temperatures were lower and a high growth rate continued into July.

Buffalofish

CERTAIN ANTIOXIDANTS LENGTHEN STORAGE LIFE OF FROZEN BUFFALOFISH PRODUCTS:

By retarding the development of rancidity, certain antioxidants are more effective in lengthening the cold-storage life of frozen buffalofish products. This finding is based on studies by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Ann Arbor, Mich. The frozen reconstituted product had been in storage for 27 weeks. Samples containing the antioxidant Tenox 2 had not developed detectable rancidity; those containing nordihydroguniretic acid were on the borderline of acceptability. Control samples were unacceptable after 12 to 13 weeks of storage.

The smoked buffalofish rib product had been in storage 13 weeks. Ribs treated with propyl gallate had developed no rancidity, but the development of mold could prove to be a limiting factor. Controls stored at approximately 37° F. became rancid within four weeks. The same products stored at 0° F. developed no rancidity. Pilot investigations along those same lines are being planned for frozen catfish.

California

STATE AGENCIES MOVE TO HALT FISH LOSSES FROM AGRICULTURAL PESTICIDES:

Recommendations for methods of preventing agricultural pesticides from killing fish were distributed in mid-August 1963 by the California State Department of Agriculture and the University of California Extension Service. The action followed a California Department of Fish and Game investigation of fish kills in the lower Sacramento Valley.

The California Department of Agriculture announcement warned persons using pesticides to avoid contamination of water in drains and streams in order to prevent possible injury to fish.

The University of California Extension Service released specific instructions for agricultural practices which will reduce the hazard to fish when endrin bait is used to control cutworms. Endrin is one of the pesticides which destroyed fish. (California Department of Fish and Game, August 17, 1963.)

Note: See Commercial Fisheries Review, September 1963 p. 21.

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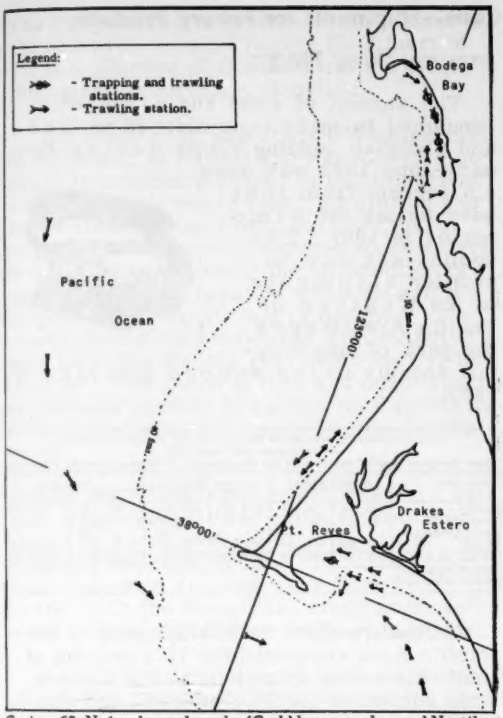
GROWTH AND LIFE HISTORY OF DUNGENESS CRAB INVESTIGATED:

M/V "Nautilus" Cruise 63-N-1a, 1b, 1c, 1d, and 1e - Crab (January 7-12, 1963; February 4-9; March 4-9; April 1-6; May 6-11): To collect Dungeness or market crabs (Cancer magister) for growth studies and life history observations and to determine time of occurrence and relative abundance of crab year-classes were the objectives of this series of cruises by the California Department of Fish and Game research vessel Nautilus. The area of operations was in the coastal waters off central California from Bodega Bay to San Francisco.

Collections of crabs were made with a modified Gulf shrimp trawl with $1\frac{1}{4}$-inch mesh; 5 commercial-type crab traps; and seven 1-inch mesh crab traps. Trawling was done at each station. Tows lasted 20 minutes each and generally covered 0.75 miles. Crab traps were baited with squid and rockfish and fished overnight. Exploratory trawling was done where traps were not set. Stations were in 4 to 70 fathoms. Several stations were revisited each month.



Cruises 63-N-1a, b, c, d, and e (Crab) by research vessel Nautilus, showing some of the trawl and trap stations.

A total of 83 tows and 13 trap sets yielded 3,465 crabs--1,939 from Bodega to Point Reyes and 1,526 from Point Reyes to San Francisco.

Shoulder width measurements, taken in front of the 10th anterior-lateral spines, were made for all crabs. The 1961 year-class made up 81 percent (1,224) of the crabs sampled at Bodega and 50 percent (759) at San Francisco. The sex ratio at Bodega among the 1961 year-class was 1:1. At San Francisco, females made up 76 percent of the crabs measuring 86 to 145 millimeters (3.4 to 5.7 inches). Most crabs of the 1961 year-class remained in the 11th and 12th instars, 100 to 145 millimeters (3.9 to 5.7 inches), since September 1962. The 1962 year-class comprised 3 percent of the crabs at Bodega and 28 percent at San Francisco. Crabs 3 years old and older accounted for the rest of the sampling of those areas.

The crabs were also examined for hardness, for indications that females had carried eggs, and for mating marks on males. The mating marks result from close contact during the premating embrace and occur on the manus, carpus, and merus of the cheliped. The marks are such as might be made by a grinding wheel.

Mating activity was noted on the January cruise. A 166 millimeter (6.5 inches) male crab clutching a 109 millimeter (4.3 inches) female was taken in the net. Two males measuring 156 and 179 millimeters (6.1 to 7.0 inches) had two sets of mating marks. One set apparently made during 1962 and the second set during January 1963, indicated some of the crabs of that size do not molt for at least a year.

Leopard sharks (Triakis semifasciata) were noted as predators of small crabs. The stomachs of five leopard sharks 3 to 4 feet long were examined and one contained five crabs with a width measurement of 45 to 50 millimeters (1.4 to 1.8 inches).

In January and February, 45 percent of the females examined and carrying eggs or showed signs of having carried eggs. Of the egg masses examined in January, 75 percent had partly hatched.

Note: See Commercial Fisheries Review, March 1963 p. 20.

Canning

CAN-DRAINING DEVICE TO AID SAMPLE INSPECTION:

The Inspection and Certification Service of the U. S. Bureau of Commercial Fisheries has the responsibility for evaluating and passing upon the quality of fresh, frozen, and canned fishery products. To determine the amount of liquid present when sampling canned fish and shellfish, the inspector must drain the contents of the cans upon a screen and collect the liquid. Since a sample may consist of dozens of cans, draining several of them simultaneously would speed the work of sampling. Accordingly, a device to permit simultaneous draining was constructed. It has been used for several months and has been found (1) to speed up the work, (2) to be convenient, and (3) to be easily cleaned.

The purpose of this report is to describe its design.

The device consists of four main parts--a draining screen of No. 8 stainless steel

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 691

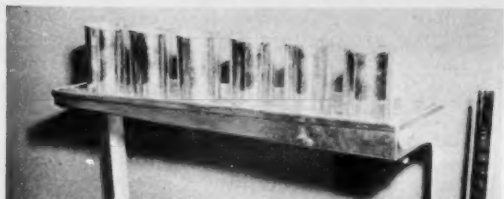


Photo of draining device assembled and ready for use.

mesh, a liquid collection tray of stainless steel, a base tray also of stainless steel, and two aluminum supporting brackets of $\frac{1}{8}$-inch plate. The brackets support the screen and the collection tray above the base tray. The collection and base trays are fitted at the ends with two brass buttons that drop into corresponding slots in the top and the bottom of the supporting brackets. The collection tray is sloped so that liquid flows toward a drain located at one end of the tray.

By lifting the liquid collection tray out of the slots in the top of the supporting brackets and removing the brackets from the base tray, the inspector can place all of the parts of the device in the base tray for storage.

The dimensions of the draining screen are $6\frac{3}{4}$" x $24\frac{3}{4}$". When assembled for use, the device is 12" wide, 26" long, and 12" high. When it is nested into the base tray, it is 12" x 26" x 2". The device as constructed will accommodate six No. 1 tall cans simultaneously. Dimensions may be altered if a different capacity of cans is desired.

--Lynne G. McKee, Food Technologist,
Technological Laboratory,
U. S. Bureau of Commercial Fisheries
Seattle, Wash.

Cans--Shipments for Fishery Products, January-June 1963

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-June 1963 was down 4.5 percent from that used during the same period in 1962. The decline was due to smaller shipments to the Western or Pacific Area where the pack of tuna dropped sharply in the second quarter of 1963.

U. S. Domestic Shipments of Metal Cans for Fishery Products, January-June 1963 and 1962
(Base Boxes of Metal Consumed in the Manufacture of Cans of Fishery Products)

Receiving Area	First Quarter		Second Quarter		Jan.-June	
	1963	1962	1963	1962	1963	1962
East[1/]	155,814	158,531	215,924	189,556	371,738	348,087
Southern	21,010	13,403	38,197	32,668	59,207	46,071
North Central	29	63	5	29	34	92
West[2/]	381,735	414,199	629,376	701,831	1,011,111	1,116,030
Total all areas	558,588	586,196	883,502	924,084	1,442,090	1,510,280

1/Includes Puerto Rico.
2/Includes Alaska and Hawaii.

In January-June 1963, shipments to the Pacific Area accounted for 70.1 percent of total shipments; shipments to the Eastern Area accounted for 25.8 percent; and shipments to the Southern Area accounted for most of the remaining 4.1 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.
(2) See Commercial Fisheries Review, July 1963 p. 35.

Central Pacific Fisheries Investigations

DISTRIBUTION OF SKIPJACK TUNA AND OTHER LARGE FISH OF OPEN SEA: M/V "Charles H. Gilbert" Cruise 67 (Boundary II) (July 1-August 4, 1963): To study the patterns of distribution of skipjack tuna and other large fish of the open sea in relation to water currents and water types

was the principal objective of this cruise by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

The study area was about 300 miles east of the island of Hawaii and was selected because it includes portions of two important central Pacific water types, California Current Extension and North Pacific Central waters. The boundary between those waters is believed to influence the distribution of the skipjack tuna (aku) on which Hawaii's largest commercial fishery depends. The vessel fished the study area with modified tuna long-line fishing gear and with live bait (tilapia). The catch of tuna and other species of fish was greater in California Current Extension water than in North Pacific Central water.

The effectiveness of modified 6- and 21-hook long-line gear for catching tuna was tested in the immediate vicinity of 150° W. longitude between 14° and 22° N. latitude. Four long-line stations were fished en route to and 12 in the designated study area; another station was fished on the return trip.

A total of 5 long-line stations were fished off the Kona coast of Hawaii to test the effectiveness of the modified tuna long-line gear. There were 20 baskets of 21-hook gear (2-fathom droppers) with 20-fathom floatlines, and 40 baskets of 6-hook gear (14-fathom droppers), 20 of which had no floatline and 20 with 10-fathom floatlines. There was an excessive amount of tangling (branch on mainline) when hauling the 21-hook gear. The fishermen also experienced some difficulty in setting the 21-hook gear. For the 5 stations off Kona, the 21-hook gear caught 0.23 fish per hundred hooks, while the 6-hook gear caught 0.58 fish per hundred hooks. Fish (Sciaenids and opelu) were used as bait on the 6-hook gear throughout the cruise, while squid and fish were alternately used on the 21-hook gear.

The association of skipjack and other fish with the northern boundary of the California Current Extension water was studied. In the study area of 150° W. longitude, 12 long-line stations were fished. These were located north and south of, and in the boundary between the California Current Extension water and North Pacific Central water. The boundary was identified from surface salinity observations made at about 30-mile intervals. The tuna catch in that area consisted of 1 albacore and 1 skipjack taken in Zone A (north of boundary); 8 big-eyed tuna, and 2 skipjack taken in Zone B (in the boundary); and 14 big-eyed tuna taken in Zone C (south of boundary). Mahimahi and large blue shark were caught in increasing numbers in going from north to south while the catch of Alepisaurus decreased. Of the 22 big-eyed tuna taken, 10 were caught on the 6-hook, 10-fathom floatline gear, 8 were taken on the 6-hook, 0-fathom floatline gear, and 4 were taken on the 21-hook, 20-fathom floatline gear.

Miscellaneous observations during Cruise 67 were as follows:

1. A total of 57 mahimahi (Coryphaena hippurus) were caught by pole-and-line using live bait (tilapia) under a floating log (Zone C). Twenty fish were sampled for length, weight, and sex. About 90 percent of the stomachs examined were empty (except for tilapia) and the remainder contained varying amounts of squid and flying fish.

2. Twelve surface plankton tows were made in the study area.

3. Five night-light stations were occupied during the cruise. One tuna postlarva was taken by dipnet at a night-light station off the Kona coast. Attempts to keep the larva alive failed.

4. All fish caught on the long-line and trolling gear were measured and their stomachs preserved.

5. A total of 15 samples of blood were collected from troll- and long-line-caught fish; 12 of those were from big-eyed tuna, 2 from skipjack, and 1 from a blue marlin.

6. A total of 20 bird flocks was sighted; 10 of those were sighted off the Kona coast. One was associated with a yellowfin school, but the species in the remaining schools were not identified. Of the 10 flocks sighted in the study area, 2 were associated with skipjack, 1 with yellowfin, and 1 with mahimahi. Species in the remaining schools were not identified.

7. A total of 1,000 drift cards was released in the study area and off the leeward coast of Molokai, Lanai, Maui, and Hawaii.

8. One skipjack, 3 mahimahi, and 2 wahoo were taken on the trolling lines.

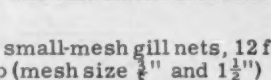
9. A canvas raft buoyed with four metal floats was attached to the end of the long-line. The raft was abandoned after being used at six long-line stations because it drifted considerably faster than the lines and caused the lines from several of the baskets at the end to become entangled. The raft did not increase the catch rate.

10. Two small-mesh gill nets, 12 feet long and 50 feet deep (mesh size $\frac{3}{5}$" and $1\frac{1}{2}$") were fished experimentally for the Albacore Ecology Program. Information on the setting and retrieving of those nets were relayed to the Chief, Albacore Ecology Program. No fish were taken in the nets. Fragments of jellyfish were found enmeshed in the $1\frac{1}{2}$" mesh gill net.

11. The theremograph and barograph were operated continuously whenever the ship was at sea.

12. Two mahimahi were brought back alive in the bait well and were transferred to shoreside-holding facilities.

Note: See Commercial Fisheries Review, May 1963 p. 25 and February 1963 p. 23.



Federal Purchases of Fishery Products

DEFENSE DEPARTMENT CHANGES PREAWARD INSPECTION PROCEDURES FOR OYSTERS:

The Defense Subsistence Supply Center (DSSC), Department of Defense, has issued a notice to the trade dated July 31, 1963, announcing a change in preaward inspection procedures for oysters.

Effective immediately, authority will not be granted for preaward inspection of oysters during the period June 1 through September 30, 1963, and until rescinded, during the same period in future years.

Preaward stocks packed prior to June 1 will be acceptable for delivery on DSSC contracts June 1 through September 30, 1963, and for that same period in future years. In addition, fresh-caught oysters will be acceptable during that period, with Veterinary Corps inspection performed after date of award, provided that laboratory analysis indicated that the Coliform Index does not exceed "most probable number (MPN) of 160,000 per milliliter."

* * * * *

DEPARTMENT OF DEFENSE DOES NOT BUY CANADIAN FOODS UNDER BUY AMERICAN ACT EXEMPTION AUTHORITY:

Recently there have been fishing industry inquiries regarding the relationship of Clause 14 (Buy American Act) on Standard Form 32 to purchases of food items of Canadian origin. A letter from the General Services Administration to the U. S. Bureau of Commercial Fisheries received in August 1963 explains as follows:

"Clause 14 on Standard Form 32 is designed, as you know, to implement the Buy American Act and Executive Order No. 10582, and is applicable to all executive agencies. The clause, as it currently appears on Standard Form 32, does not contain any reference to Canada.

"The Buy American Act confers authority directly on each agency to carry out the requirements of the Act. However, the Act also provides that purchases are exempt from the requirements of the Act where an agency head determines that the making of such purchases in accordance with the Act's requirements would be inconsistent with the public interest.

"The Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) have exercised their exemption authority under the Act with respect to products of Canadian origin and, with certain exceptions, have exempted such products from the requirements of the Act. On the basis of these actions, DOD and NASA have supplemented the standard Buy American Act clause on Standard Form 32 by adding the words 'or Canada' to paragraph (a)(iii) of the clause following the words 'United States.' However, the General Services Administration and, to our knowledge, other executive agencies have not found it appropriate to make similar determinations.

"Although the Department of Defense has exempted most Canadian products, it has not extended the exemption to include food items. When food items are purchased by DOD, the language 'or Canada' is not included in the clause. On the other hand, while the National Aeronautics and Space Administration includes 'or Canada' in the clause when making purchases of food items, we understand that NASA's purchases of food items are very small.

"In the final analysis, with the exception of NASA, purchases of food items of Canadian origin by DOD, the General Services Administration, and other executive agencies, are not being exempted from the requirements of the Buy American Act and Executive Order No. 10582 and are being effected pursuant to the Buy American Act clause set forth in the September 1961 edition of Standard Form 32."

Fishermen

INTERIOR DEPARTMENT URGES RESTORATION OF PUBLIC HEALTH SERVICE BENEFITS TO SELF-EMPLOYED COMMERCIAL FISHERMEN:

The Department of the Interior in August 1963 recommended amendments to H.R. 3873 now before Congress which would permit certain owners of commercial fishing vessels to receive medical care and hospitalization without charge at hospitals of the Public Health Service.

The Department has submitted a draft bill to Congress aimed at restoring to self-employed seamen on fishing vessels the medical benefits they enjoyed prior to 1954.

Prior to 1954, self-employed fishermen were eligible for medical care in hospitals, out-patient clinics, and other medical facilities of the Public Health Service, but an administrative ruling by that agency in that year held

in effect that the term "employed" referred to services rendered in an employe status under a contract of hire. Subsequently, the regulations were changed to exclude the owner or joint owners of a vessel or the spouse thereof from receiving such medical benefits.

Interior's Assistant Secretary for Fish and Wildlife Frank P. Briggs informed Congress that the Department's draft bill would clearly provide that "seamen" include owners or joint owners of vessels and would include "self-employed" seamen among those eligible to receive medical benefits.

"Thus, the principal effect of our proposal . . . . . is to restore to all self-employed seamen the medical benefits enjoyed prior to 1954," Briggs wrote in a letter to Congress.

Briggs said that while the Department agrees "with the objectives of H.R. 3873, we believe that these can best be accomplished through our draft bill. Accordingly, we recommend enactment of H.R. 3873 in the form of our suggested draft bill."

H.R. 3873 would expand the authority of the Public Health Service Act to include commercial fishing vessel owners who accompany their vessels on fishing operations and substantially perform services comparable to seamen employed on such vessels or on vessels engaged in similar operations.

"We believe that the provisions of this bill (H.R. 3873) are too restrictive," Briggs wrote. "The bill would limit the benefits of the act to commercial fishermen alone and not include other self-employed persons who may be engaged on board a vessel in the care, preservation or navigation thereof. Further, it would require a finding that the self-employed person is engaged substantially in the care, preservation or navigation of a vessel before receiving the benefits of the act. We believe such a test would be difficult to meet in every instance and even more difficult to administer."

Briggs pointed out that generally owner-fishermen perform the same duties and engage in the same activities as do employe fishermen under a contract of hire. They face the same dangers and are subject to the same injuries and sicknesses as employe fishermen.

Frequently, he continued, adequate community hospital facilities are not available to them because of the transient nature of their work which takes them away from their home community health and welfare facilities.

"The legislative history of the hospital and medical care program for seamen suggests that the participation of the Federal Government in providing medical care to seamen rests primarily on a national interest in assuring an effective labor force which is necessary for an adequate merchant marine. Self-employed fishermen also add to this maritime labor force, since they have developed maritime skills necessary to all good seamen," Briggs said.

Fish Protein Concentrate

CONTRACT PROPOSAL FOR FISH PROTEIN CONCENTRATE RESEARCH IN INDIA:

"Studies on Nutritive Values of Fish Protein Concentrates," is the title of a contract proposal under Public Law 480. It was received in June 1963 from the India Council of Medical Research. The research is to be done by an Indian scientist at the Nutrition Research Laboratory in Hyberdad, India.

The work is to consist of animal and human feeding studies using fish protein concentrates manufactured by several different processes. The contract is to run for two years and the cost will about $49,000.

Contracts of this type are considered valuable from a research standpoint as data on fish protein concentrates is gathered from areas where there is a developing potential for a dietary protein supplement.

The contract proposal was the result of a visit to India by a technologist of the U. S. Bureau of Commercial Fisheries Technological Laboratory, Seattle, Wash.

Great Lakes Fishery Investigations

DEPTH DISTRIBUTION STUDIES OF CHUBS AND ASSOCIATED SPECIES IN LAKE MICHIGAN:

M/V "Cisco" Cruise 7 (August 13-27, 1963): The depth distribution of larval and adult chubs and associated fish species was studied during this cruise by the U. S. Bureau of Commercial Fisheries research vessel Cisco. The area investigated was in the Grand Haven-Saugatuck region of Lake Michigan.

Half-meter and meter plankton nets were towed at various levels from the surface to near bottom over 13 different bottom depths ranging from 3 to 50 fathoms. All larvae collected in those nets were alewives, except for three coregonids (chubs). Alewife larvae were caught in nearly all tows over bottom depths less than 40 fathoms, and in some tows out to 50 fathoms. They were most numerous in areas with bottom depths of 10 fathoms or less. In deeper water, most of the alewife larval were found in the upper levels. Coregonid larvae which were numerous in June, probably had grown large enough to escape the nets.

Five-foot and 9-foot square tow nets were fished at night at various levels over bottom depths of 10, 15, 25, and 40 fathoms. Both of those nets caught a few adult alewives, smelt, "bloater" chubs (Coregonus hoyi), and ninespine sticklebacks. None of the "bloater" chubs was

of the small size (1 to 7 inches) which was hoped might be taken with the nets. The 9-foot net also caught up to 30 alewife larvae per half-hour tow, but the 5-foot net caught very few of them.

Standard bottom trawl tows (10 minutes with a $\frac{3}{4}$-size North Atlantic whiting trawl) were made at 8 depths from 3 to 17 fathoms, and at 5-fathom intervals from 20 to 50 fathoms. From 2 to 6 tows were made at each depth sampled in the 3- to 17-fathom range (a total of 27 tows); single tows were made at 20 fathoms and deeper. Tows at 17 fathoms and deeper produced the usual summer catches for the area--mostly chubs (practically all "bloater" chubs), fair numbers of slimy sculpin, a few alewives, and, at 45 and 50 fathoms, rather large numbers of deepwater sculpin. The composition of catches at 15 fathoms and shallower changed during the cruise, probably because of pronounced changes in water temperature. Early in the cruise, with shallow-water temperatures mostly around 48° to 50° F., "bloater" chubs were fairly numerous in depths as shallow as 7 fathoms, and were present at 5 fathoms; yellow perch were common in depths as shallow as 5 fathoms, most abundant at 10 fathoms, and rare at 15 fathoms. Near the end of the cruise, after bottom temperatures at 10 fathoms and shallower had risen 10° to 15° F., "bloater" chubs and yellow perch were uncommon inside of 12 fathoms and 10 fathoms, respectively. Yellow perch were most numerous at 12 fathoms and common at 15 fathoms. Smelt, spottail shiners, and trout-perch also moved into deeper waters as the inshore water warmed.

The Bureau's Branch of Exploratory Fishing used the M/V Cisco during cruise 5 (July 2-16), and the vessel was under contract to the University of Wisconsin during cruise 6 (July 23-August 8). No reports on those cruises were issued by the Bureau's Biological Laboratory at Ann Arbor, Mich.

Note: See Commercial Fisheries Review, August 1963 p. 27.

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LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

M/V "Siscowet" Cruise 5 (July 29-August 6, 1963): To compare the relative abundance of juvenile lake trout with previous years' catches at Isle Royale in Lake Superior, and to collect various forms of chubs from the north shore of Lake Superior for morphological and electrophoretic studies were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Studies during cruise 5 were at Isle Royale, Mich., and Thunder Bay, Black Bay, and Nipigon Bay, Ontario.

Small-mesh ($2\frac{1}{4}$-$3\frac{1}{2}$ inches) gill nets were fished north of Thompson Island, southeast of Menagerie Island, and south of Mott Island off Isle Royale. Juvenile lake trout appeared to be about as abundant as in 1958-61. A special set was made about 2 miles southeast of Mott Island, to collect biological data from a group of slow-growing lake trout which mature at lengths of 14-18 inches and spawn in mid-September, nearly a full month before the lean-trout spawning season. Blood samples for electrophoretic studies were collected from the various forms of lake trout taken at Isle Royale.

Other species caught in the gill nets during this cruise included "bloater" chubs (Coregonus hoyi) and two other species of chub (C. zenithicus and C. kiyi).

One 15-minute trawl tow in Siskiwit Bay yielded 175 pygmy whitefish and smaller numbers of sculpin, smelt, and yearling chubs.

A small gang of gill nets (2 nets each of $2\frac{1}{4}$- and $2\frac{1}{2}$-inch mesh) set at 20 fathoms between Pie and Welcome Islands in Thunder Bay caught 119 smelt, 1 lake trout, and 55 chubs. Most of the chubs were preserved for later study. The chub species Coregonus reighardi dymondi was believed represented in the chub collection from that area.

The work in Black Bay included the fishing gill nets (2 nets each of $2\frac{1}{4}$- and $2\frac{1}{2}$-inch mesh at 13-23 fathoms north of Irno Island, west of George Point, and west of Copper Point. Only small numbers of smelt, lake herring, and chubs were taken. The best catches of lake herring and chubs were made in the southern end of the Bay where the water was less turbid than in the more northerly locations. Two trawl tows at 15 fathoms between George Point and Copper Point yielded 150 smelt, 1 lake herring, and 1 yellow pike. Rough bottom prevented trawling in other areas.

Gill nets (mesh sizes, $2\frac{1}{4}$-$4\frac{1}{2}$ inches) were set in the Nipigon Bay region north of Anguros Island, north of Salter Island, Moffat Strait, and southwest of Simpson Island. The species and number of fish caught in each area are shown in the table on page 23.

Species Caught by Area, M/V Siscowet Cruise 5

Species	Location and Depth (Fathoms)			
	N. Anguros Island	N. Salter Island	Moffat Strait	S. W. Simpson Island
	15 Fm.	16-28 Fm.	16-17 Fm.	25-65 Fm.
	(No. of Fish)			
Chub	11	139	10	830
Smelt	22	48	2	-
Lake herring	7	22	27	-
Lake trout	5	5	5	8
Round whitefish	-	-	4	-
Burbot	-	1	-	-

Eighteen of the 23 lake trout caught were fin-clipped. Those hatchery-reared fish had been planted in the Rossport-St. Ignace Islands region in 1959-63. The physical characteristics of many of the chubs differed from those commonly taken on the south shore of Lake Superior. Many of the chubs were preserved for further study.

Two trawl tows at 27 fathoms, 3 miles north of Moffat Strait in Nipigon Bay, yielded 47 chubs, 123 smelt, 2 lake trout, and 4 sculpin. The lake trout caught in that area had been planted in the Rossport area in the spring of 1963.

Typical surface water temperatures at the various locations were: Isle Royale, 52° F.; Thunder Bay, 62° F.; Black Bay, 65° F.; Nipigon Bay, 61° F.; and Moffat Strait, 60° F.

Note: See Commercial Fisheries Review, September 1963 p. 28.

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SEA LAMPREY CONTROL BY CHEMICAL TREATMENT ENCOURAGING:

The sea lamprey at assessment barriers in Lake Superior at the end of May 1963 continued to show encouraging results from chemical treatments. The trend at that point near the end of the season, although 19 percent greater than the previous year's count, was 85 percent less than in 1961. The take of spawning-run sea lamprey was 9,952 compared with 8,369 in 1962 and 64,663 in 1961. The lamprey count at three "index" rivers in Lake Michigan was 7,425 as compared with 8,067 in 1962 and 12,886 in 1961. Comparison of lamprey catches with previous years in the three streams was nullified by the treatment of one of the streams during mid-May.

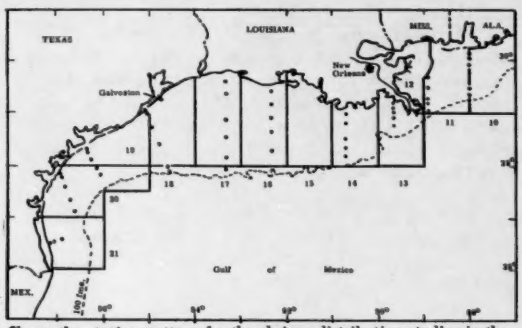
Note: See Commercial Fisheries Review, July 1963 p. 38.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-8 (August 16-31, 1963): The best brown shrimp catches were made in the 10-20 fathom depth range in 5 areas out of the 10 statistical areas worked during this cruise. The predominant size of brown shrimp caught was 15-20 (heads-off) count; white shrimp catches were relatively small, and sizes of these were variable from 15-20 count to very small shrimp counting over 68 to the pound.

Excellent fishing weather prevailed during this cruise by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Texas. One 3-hour tow with a 45-foot shrimp trawl was made in each of the 3 depth ranges in all areas.



Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during Cruise 8 of GUS-III.

Shrimp catches were especially good in areas 16 and 18, each yielding about 125 pounds of mostly all brown shrimp principally from 10-20 fathoms, but with better than moderate catches from the other depth ranges.

The catch from area 10 totaled 91 pounds of 15-20 count shrimp, all of it from 2 depth ranges--up to 10 fathoms and 10-20 fathoms. In addition to brown shrimp, those depths also yielded 25 pounds of white and pink shrimp. The 3-hour tow made in the over 20-fathom range of that area was unproductive.

A total of 82 pounds was taken from area 20. All was brown shrimp except for 3 pounds of 15-20 count white shrimp from depths up to 10 fathoms. About 75 percent of the total catch in that area was in the 10-20 fathom depth range (60 pounds 21-25 count).

The only productive depth range in area 19 was 10-20 fathoms where 63 pounds of 21-25 count brown shrimp was caught.

Of the other 5 areas worked, area 17 yielded 44 pounds of large brown shrimp counting 12-15 to the pound caught in depths of 10 to over 20 fathoms, and 8 pounds of 21-25 count white shrimp from up to 10 fathoms. Shrimp catches in the remaining areas ranged from a low of only 3 pounds up to 30 pounds.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Sept. 1963 p. 29.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-JULY 1963:

Skipjack tuna landings in Hawaii in July 1963 were about 1.6 million pounds, 300,000 pounds below the 1948-62 average for the month. The cumulative total catch for January-July 1963 was 4.4 million pounds, almost 1.7 million pounds below the 1948-62 average for the same period.

During July there were 147 productive trips, giving an average of 7,352 pounds per trip. Individual catches ranged from 85 pounds to 50,050 pounds.

Industrial Fishery Products

STUDIES BEGUN ON PRODUCTION OF ANIMAL FEEDS FROM UNDERUTILIZED FRESH-WATER FISH:

Laboratory-scale studies on the production of fish and animal feeds from underutilized rice-fish farm species such as buffalofish, carp, and gizzard shad, were begun in August 1963 by the U. S. Bureau of Commercial Fisheries Technological Laboratory, Ann Arbor, Mich. Those coarse fish species contain the thiaminase (anti-vitamin B_1) factor, which is the subject of a study now in progress at the Laboratory. The thiaminase factor has caused considerable problems in the use of those coarse species in feeding work. Close coordination of the two studies will be maintained and will be aided by the procedure for quantitatively determining thiaminase activity recently developed by the Bureau's laboratory staff.

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U. S. FISH MEAL, OIL, AND SOLUBLES: Major Indicators for U. S. Supply, July 1963: United States production of fish meal in July 1963 was lower by 23.3 percent as compared with July 1962. Fish oil and fish solubles production also decreased by 38.3 percent and 14.0 percent, respectively.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, July 1963

Item and Period	1963	1962	1961	1960	1959
	(Short Tons)				
Fish Meal:					
Production 1/:					
September	-	31,165	28,642	36,239	36,874
August	-	38,955	57,031	49,709	47,364
July	40,317	52,574	62,586	55,696	52,132
January-June	90,158	114,375	109,140	90,939	91,473
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tot.	-	310,000	311,265	290,137	306,551
Imports:					
September	-	13,698	13,941	9,487	9,224
August	-	26,253	19,026	8,340	5,695
July	-	25,857	18,710	13,131	4,303
January-June	181,934	140,886	107,463	66,375	101,421
January-December	-	252,307	217,845	131,561	133,955
Fish Solubles:					
Production 3/:					
September	-	12,009	11,415	12,367	25,651
August	-	15,833	19,603	16,891	30,378
July	19,061	22,165	21,870	20,208	33,133
January-June	40,484	49,236	37,953	39,291	63,315
Jan.-Dec. prelim. totals	-	120,886	109,018	106,361	176,913
Jan.-Dec. final tot.	-	124,334	112,241	98,929	165,359
Imports:					
September	-	178	263	38	1,732
August	-	422	318	180	4,718
July	-	306	708	96	4,938
January-June	2,439	4,290	1,219	2,518	9,825
January-December	-	6,308	6,739	3,174	26,630
	(1,000 Pounds) 5/				
Fish Oils:					
Production:					
September	-	30,723	24,988	30,530	22,383
August	-	33,526	50,749	38,052	30,043
July	28,744	46,608	58,533	41,362	32,108
January-June	69,788	92,864	87,298	53,101	62,077
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,240
Jan.-Dec. final tot.	-	255,808	266,670	215,861	193,324
Exports:					
September	-	219	9,521	13,959	8,469
August	-	33,272	13,304	1,395	18,367
July	-	128	4,421	40,603	28,276
January-June	97,806	63,005	68,128	52,838	49,358
Jan.-Dec. totals	-	123,050	122,486	143,659	144,481

1/Does not include crab meal, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
Note: Data for 1963 are preliminary.

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Production by Areas, August 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production[1] of Fish Meal, Oil, and Solubles, August 1963 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized[3]
	Short Tons	1,000 Pounds	Short Tons	Short Tons
August 1963:				
East & Gulf Coast	38,442	29,638	16,141	762
West Coast[2]	4,894	2,862	2,485	-
Total	43,336	32,500	18,626	762
Jan.-Aug. 1963 Total	174,009	131,032	71,799	7,134
Jan.-Aug. 1962 Total	207,175	172,986	81,014	8,065

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

* * * * *

Production, July 1963: During July 1963, 37,950 tons of fish meal and 29.4 million pounds of oil were produced in the United States. Compared with July 1962, this was a decrease of 17,652 tons or 31.7 percent in meal and scrap production, and a decrease of approximately 18.3 million pounds or 38.4 percent in oil.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, July 1963 1/with Comparisons

Product	July		Jan.-July		Total
	1/1963	1962	1/1963	1962	1962
	(Short Tons)				
Fish Meal and Scrap:					
Herring	2,111	1,355	2,726	2,696	5,095
Menhaden 2/	31,278	49,203	99,806	137,975	238,680
Sardine, Pacific	-	-	0	646	702
Tuna and mackerel	1,282	2,148	11,651	17,116	26,559
Unclassified	3,279	3,696	14,101	19,003	27,297
Total	37,950	55,602	128,293	177,438	298,333
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	12,899
Grand total meal and scrap	3/	3/	3/	3/	311,232
Fish solubles:					
Menhaden	13,186	18,234	39,024	48,509	84,885
Other	1,640	2,773	10,309	17,136	28,353
Total	14,828	21,007	50,133	65,665	113,238
Homogenized condensed fish	2,531	1,300	6,372	8,020	11,096
	(1,000 Pounds)				
Oil, body:					
Herring	2,084	1,717	2,428	2,802	5,255
Menhaden 2/	25,316	43,903	89,917	132,182	237,815
Sardine, Pacific	-	-	-	148	167
Tuna and mackerel	379	531	2,043	2,703	5,175
Other (including whale)	1,625	1,540	5,302	5,649	7,396
Total oil	29,384	47,690	99,688	143,294	255,808

1/Preliminary data.
2/Includes a small quantity of thread herring.
3/Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Menhaden meal showed a decrease of 16,925 tons or 35.1 percent, while menhaden oil (25.3 million pounds) was 42.3 percent less than in July 1962.

A total of 14,828 tons of fish solubles was manufactured in July 1963--a decrease of 29.4 percent compared with the same month in 1962. Production of homogenized condensed fish amounted to 2,531 tons--an increase of 1,331 tons or 110.9 percent.

The quantity of fish meal processed during the first 7 months of 1963 amounted to 128,293 tons--49,145 tons less than in the same period of the previous year. Fish solubles and homogenized fish production totaled 56,505 tons--a decrease of 17,180 tons. Production of marine-animal oil amounted to 99.7 million pounds--a decrease of 43.6 million pounds.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-July 1963: Based on domestic production and imports, the United States available supply of fish meal for January-July 1963 amounted to 353,450 short tons--9,269 tons (or 2.7 percent) more than during the same period in 1962. Domestic production was 128,293 tons (or 27.7 percent) less, but imports were 58,414 tons (or 35.0 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 167,542 tons.

The United States supply of fish solubles (including homogenized fish) during January-July 1963 amounted to 59,274 tons--a decrease of 19,007 tons as compared with the same period in 1962. Domestic production and imports dropped 23.3 percent and 39.8 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-July 1963 with Comparisons

Item	Jan.-July		Total
	1/1963	1962	1962
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	99,806	137,975	238,680
Tuna and mackerel	11,651	17,116	26,559
Herring	2,726	2,696	5,095
Other	14,110	19,651	40,898
Total production	128,293	177,438	311,232
Imports:			
Canada	30,752	27,232	42,806
Peru	167,542	123,859	186,249
Chile	19,088	7,157	9,247
So. Africa Republic	4,826	7,984	10,084
Other countries	2,949	511	3,921
Total imports	225,157	166,743	252,307
Available fish meal supply	353,450	344,181	563,539
Fish Solubles:			
Domestic production 2/	56,505	73,685	124,334
Imports:			
Canada	1,541	795	1,335
Iceland	-	2,205	2,332
Other countries	1,228	1,596	2,641
Total imports	2,769	4,596	6,308
Available fish solubles supply	59,274	78,281	130,642

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

Irradiation Preservation

ANOTHER IRRADIATED FISHERY PRODUCTS MARKET RESEARCH STUDY:

A market research study on the future orderly marketing of irradiated fishery products is to be made by the U. S. Bureau of Commercial Fisheries for the Atomic Energy Commission (AEC). The study stems from AEC's interest in low-dose radiation food preservation development and a determination of the conditions under which radiation-processed fishery products should be marketed in order to provide the greatest overall benefits to the fishing industry--from producer-processor-distributor to the consumer.

The new project with AEC, for which an agreement has already been prepared, will consist of a two-phased market research program. The objective of the first phase will be to elaborate further on a 1960 marketing feasibility study, and it is expected that the results of this phase will enable the Bureau to compare present losses involved in marketing fresh fishery products with the potentially fewer losses accruing from the advantages of the radiation-pasteurization process. In addition, this phase of the study should also help in an evaluation of the impact of radiation pasteurization on market supplies, methods of marketing, and structure of markets for certain fishery products.

The second phase of the program involves a pilot study of attitudes and reactions of potential consumers of irradiated fishery products. The results will enable the Bureau to determine the procedures and methods of presentation required for an effective consumer education program which will condition the public to radiation pasteurization of fishery products as a coming thing, and a forward step in food technology.

In 1960, the Bureau's marketing specialists completed a project for AEC called "Marketing Feasibility Study of Radiation Processed Fishery Products," which was quite successful, and provided much new and valuable information that contributed greatly to the advancement of the radiation-processed foods program. The Bureau's marketing specialists at that time discussed the feasibility of marketing fishery products with fish producers, processors, and distributors, along with retail food groups and consumer specialists such as newspaper food editors and extension people. A comprehensive analytical report giving the results of the study was submitted to AEC in November 1960.

Note: See Commercial Fisheries Review, December 1960 p. 37.

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RESEARCH ON FISHERY PRODUCTS SUPPORTED BY ATOMIC ENERGY COMMISSION:

Fishery products continue to play an important role in the Atomic Energy Commission's (AEC) program on radiation and pasteurization of foods. Technological laboratories of the U. S. Bureau of Commercial Fisheries at Gloucester (Mass.), Seattle (Wash.), and Ann Arbor (Mich.), are already conducting investigations on the application of radiation to fish and seafoods. But AEC's support of studies on fishery products is not, however, limited to work in the laboratories mentioned. It also includes the new Marine Products Development Irradiator facility at Gloucester which is located adjacent to the Bureau's technological laboratory there. The fishery products irradiator is being built to demonstrate the feasibility of extending the refrigerated storage life of fresh fishery products as a part of the AEC radiation-pasteurized food program. AEC also has awarded a contract to a New York Engineering firm for the conceptual design of a shipboard irradiator, and is sponsoring research on seafoods at the Massachusetts Institute of Technology, University of Washington, and Louisiana State University.

Some of the more significant research findings obtained by midyear of 1963 on the application of radiation to fishery products indicate that (1) the edible shelf life of haddock, ocean perch, clams, shrimp, king crab, and flounder can be extended to at least 30 days when irradiated to levels from 100,000 to 450,000 rads and stored at 33° F., (2) the amino acids and B vitamins of fishery products are not adversely affected by irradiation, (3) some strains of bacteria may be more resistant to irradiation than others and, (4) it may be possible to use gas chromatographic techniques to measure development of off-odors or flavors in long-stored irradiated seafoods. In addition to the above research program, the AEC is conducting toxicological and microbiological studies that will provide data for Food and Drug Administration (FDA) approval of radiation pasteurization.

Developmental work on the commercial acceptability or irradiated fishery products

is planned to begin on completion of the Marine Products Development Irradiator in the fall of 1964. Its completion will be marked by an International Conference on Irradiation to be held at Boston and Gloucester, Mass. That facility will process 1,000 pounds of fish per hour at a level of 500,000 rads and will provide those fishery products to industry and consumer groups for large-scale evaluation. It is anticipated that FDA approval of low-level radiation may be realized in a few years, and that industry will then start to gradually promote and market irradiated fishery products. At the same time, the Bureau of Commercial Fisheries will continue with more fundamental studies on irradiation designed to open up the use of this process to other fish species, and to establish methods of irradiating fish aboard vessels and re-irradiating them ashore for commercial distribution to inland areas.

Rad - The quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest. Erg - Unit of energy.

Note: See Commercial Fisheries Review, Sept. 1963 p. 33.

Michigan

PINK (HUMPBACK) SALMON EXPECTED TO REAPPEAR IN LAKE SUPERIOR STREAMS:

Sport fishermen in the State of Michigan may unexpectedly come up with pink salmon in their creels during this fall's extended trout season in Lake Superior streams.

Michigan's Department of Conservation is cooperating with other State and Federal agencies to collect information on runs of pink (humpback) salmon which were expected to follow their odd-year cycle of spawning runs in tributaries of Lake Superior this September and October. With the help of sport fishermen, who are urged to report any pink salmon caught, the agencies hope to learn whether this salt-water species has adapted itself to a new home in Lake Superior. In recent years, there have been growing signs that pink salmon are reproducing and extending their range in those waters.

A 13-inch "humpback" was caught at the mouth of the Falls River in Keweenaw Bay this past May--the first reported catch of a pink salmon from State of Michigan waters. Since 1959, nine other known catches of pink salmon have been made in Lake Superior streams in Minnesota and Ontario.

The origin of pink salmon in Lake Superior is linked to an accidental release in 1956 of young salmon from a hatchery at Port Arthur, Ont., Canada. Catch records indicate that the second generation of the escaped fish spawned successfully in 1961. Pink salmon mature and spawn in their second year, and then die. As a result, spawning runs occur only every other year. The third generation of the accidentally-released salmon should complete its two-year life cycle by spawning in Lake Superior's tributary streams.

The male pink salmon can best be identified by its prominent hump located just forward of the top or dorsal fin. This hump is less obvious in the female which might pass for an odd brown trout because of its color pattern. The tail of the male and female is usually marked with large rectangular black spots which measure up to one-half inch long. (Department of Conservation Official News Bulletin, August 22, 1963.)

Mussels

DECLINING HARVEST FROM TENNESSEE RIVER INVESTIGATED:

A full-scale investigation of the declining mussel harvest from the Tennessee River was started in mid-1963 by the Fish and Wildlife Branch of the Tennessee Valley Authority (TVA) in cooperation with other State and Federal agencies. The $80,000 study is aimed at preserving a small but colorful industry which provides employment for about 1,000 men. In 1962, the Tennessee River mussel harvest amounted to only 4,700 tons, down sharply from the average annual harvest of 10,000 tons between 1945-1955.

Since 1955, nearly all of the mussel shells have been shipped to Japan's cultured pearl industry, where a fragment of mussel shell inserted into an oyster forms the base of each pearl produced. The Japanese have found no satisfactory substitute for the Tennessee River mussel. Even the same species from the nearby Cumberland River are considered inferior. As a result, diggers have been paid as much as $180 a ton for Tennessee River shells.

There is considerable evidence that the harvest has been far greater than natural reproduction could replace. Pollution and dis-

ease also have been suspected. But more exact information is needed to guide an effective improvement program.

The current study was designed to learn the size and character of the Tennessee River mussel population, the number of species, age distribution, and what sort of bottom conditions they prefer. An attempt will be made to chart the life histories of the two most valuable mussel species. The young larvae, of microscopic size, undergo a metamorphic stage while attached as parasites to fish, then grow to useful size in about 10 years. Each mussel species has a particular kind of host fish, and the host fish for the most valuable species of mussel are still unknown.

The U. S. Bureau of Commercial Fisheries has agreed to examine Tennessee River mussels for evidence of disease or pollution damage, and for the condition of their reproductive organs. A water quality survey on Hales Bar and Guntersville reservoirs by the TVA Health and Safety Division, and data from four U. S. Public Health Service monitoring stations on the river, should indicate whether any fault in water quality is hampering mussel reproduction and growth.

Other organizations cooperating in the study are the Alabama Conservation Department, Kentucky Wildlife Resources Department, Tennessee Game and Fish Commission, and Tennessee Shell Company.

If the problem is simply overharvesting, then State regulation may be the only action needed, but if something has gone wrong with the mussel habitat the solution may be much more complicated. (Tennessee Valley Authority, Weekly News Letter, July 10, 1963.)

National Aquarium

SCIENTIFIC STUDY TEAM OUTLINES PLANS FOR NATIONAL FISHERIES CENTER AND AQUARIUM:

Age-old puzzles of why fish leap for a man-made lure one day and ignore it the next, how pollutants kill certain fish and permit others to survive, and how the temperature, salinity, and other conditions affect fish growth will be included in a wide range of scientific studies at the National Fisheries Center and Aquarium in Washington, D. C.

Such is the concept being developed by a group of leading marine scientists and aquarium experts who have made their first recommendations to Secretary of the Interior on features that should be included in an educational-scientific complex which will rank as the foremost laboratory of its type in the world. The eye-appealing surroundings will bring millions of visitors yearly to wonder at aquatic life.

The study group said the center as well as its equipment should feature the theme, "The Living World of Water," and that it should be designed to fill effectively a dual role of satisfying the general public demand while simultaneously encouraging educational and scientific advancement.

Members were enthusiastic about prospects for success of the project that is planned to repay the Federal Treasury its entire construction and maintenance cost over a 30-year period. They said aquariums throughout the world are enjoying increased popularity and agreed with the forecast that the new center in Washington should attract at least 3 million visitors a year.

Against a scientific background, the study group said, will be a series of carefully planned exhibits based on "The Living World of Water" theme and bringing to visitors a closeup view of hundreds upon hundreds of live specimens in near-natural surroundings. One such display, for example, would trace aquatic life in the Nation's largest river system, the Mississippi-Missouri from its birth in Yellowstone Park to full growth as it reaches the Gulf of Mexico.

Planners said visitors will be treated to a seemingly endless series of live displays featuring the antics of otters, porpoise, and sea lions; the horror of sharks, octopus, and great alligators; the charm and beauty of tropical fish; the great size of groupers and turtles; and the strangeness of lungfish, electric eels, four-eyed fish, and blind fish. One avenue of tanks will emphasize salt-water life, another fresh-water specimens.

Pointing out that Washington is the center of medical knowledge in the United States, the advisory group said studies at the national aquarium can be coordinated ideally with those at public health research facilities, including laboratories engaged in cancer research.

Many other fishery-based research projects are envisioned for the center. Typical ones would include the effect of water salinity and temperature on fish, the ability of certain fish to withstand pesticides and other harmful chemicals, the reaction of various fish to sudden changes in surroundings, types of food that promote growth and stamina, development of superior strains of commonly known sport and commercial fish, and more effective ways for tagging aquatic life to trace migrations and survival rates.

A center dedicated to "The Living World of Water," said the study team, "can be a unique institution that will provide opportunities for research that cannot be undertaken elsewhere; it will serve as a national and international center for research in marine and fresh-water biology."

The center is to be at Hains Point in East Potomac Park in Washington. It will be bounded by waters of the Potomac River on one side and the Washington Channel on the other.

Note: See Commercial Fisheries Review, July 1963 p. 45.

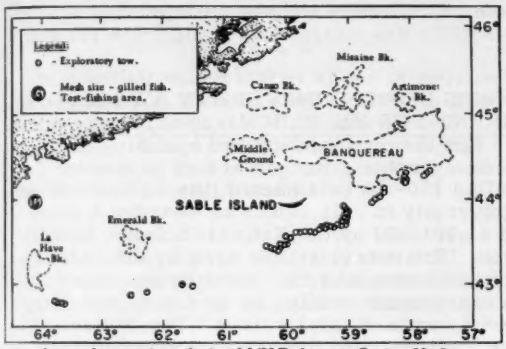
North Atlantic Fisheries

Exploration and Gear Research

OCEAN PERCH CONTINENTAL SLOPE EXPLORATIONS:

M/V "Delaware" Cruise 63-6 (July 9-20, July 29-August 9): Extending Continental Slope explorations for ocean perch off the New England coast was the principal purpose

of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The area fished extended the slope explorations to a point south of the easternmost portion of Banquero; dragging was discontinued just prior to reaching the "Stone Fence" area.



Area of operations during M/V Delaware Cruise 63-6.

The best catch-rate achieved during the cruise was 3,186 pounds of ocean perch in a 45-minute drag. The depths fished during this drag were from 215 to 245 fathoms. The position where the catch occurred was about 54 miles southeast (magnetic course) from East Point on Sable Island. (Loran positions for the drag were: Hook-up 1H1-2640, 1H2-3284; Knock-out 1H1-2642, 1H2-3272.) Fish in the catch were of excellent condition; no spots or "buttons" were observed. The average length of the fish were approximately 13 inches; the average weight was slightly under $1\frac{1}{4}$ pounds. The catch was very clean.

A total of 71 drags was made during the cruise. Of that number, 35 were 45-minute exploratory drags. An additional 10 drags were made for one hour and 6 others were made for longer than an hour in order to ascertain the size of the school of fish present. The remaining 20 drags comprised: 9 drags made to study mesh size and gilled fish ratios, 8 exploratory drags of durations other than those listed above, and 3 hang-ups.

A preliminary evaluation of the ocean perch exploration results to date indicate the absence of any large concentration of ocean perch in the slope area to the south of the Nova Scotian "Shelf;" however, small concentrations of fish are present which might sustain limited commercial fishing during periods when fish are scarce or unavailable on the regular commercial fishing grounds.

Note: See Commercial Fisheries Review, May 1963 p. 33.

North Atlantic Fisheries Investigations

FEEDING PERIODICITY OF GROUNDFISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 63-4 (June 19-25, 1963): To determine the feeding periodicity of several groundfish species and the possible changes in glycogen content of the liver was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. Trawling operations were conducted around the Block Island area on a 24-hour basis, and a total of 42 tows were made at 3-hour intervals. Over 2,000 stomachs from 8 species were examined and more than 500 fish livers were collected on this cruise.

Fishing stations were occupied in the Block Island area for 4 days to determine the periodicity of feeding, if any, and its relation to light or darkness, and tide. All of the species examined, including whiting (silver hake) and red hake, big and little skate, smooth and spiny dogfish, blackback flounder, longhorn sculpin, alewife, and several other species, appeared to have at least some degree of periodicity of feeding. All species collected in sufficient number throughout the day and night to enable preliminary statistical analysis of the data obtained showed clear signs of periodicity.

In addition, liver samples were obtained for glycogen analysis. Glycogen storage changes similarly indicated feeding periodicities.

The catch per-unit-of-effort significantly dropped at night to less than half that during daylight hours. Alewife, butterfish, whiting, and winter flounder were more vulnerable, or available, to the gear during the day. The first 3 species are known to migrate toward the surface at night but the winter flounder does not. It feeds most actively during the middle of the day at which time it is also most vulnerable to the net.

Oceanography

NORTH PACIFIC TRADE WIND ZONE OCEANOGRAPHY PROGRAM:

Although Hawaii is located within the North Pacific trade wind zone, the efforts in oceanography of the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries have hitherto not been specifically directed toward the study of the air-sea interactions and their effects on the sea in that region. Recent studies of the oceanographic climate of the Hawaiian Islands region has revealed that the southern boundary of the high salinity North Pacific Central water is seasonally displaced north-southward. These surface water displacements are believed to be associated with seasonal changes in the trade wind system.

Hawaii is located within the path of this seasonally-shifting water type boundary which also determines the success of the local skipjack tuna fishery. A study of the linkage mechanism between trade-wind system and surface-water movement is therefore of practical value to the Hawaiian fishery. Such a study, however, has much broader significance in that the trade wind zone is one of the most important energy transfer regions in the North Pacific and events there affect the whole North Pacific Central and North Pacific Equatorial circulation systems.

A trade wind zone oceanography program has been established at the Honolulu Laboratory to study the processes at the sea surface and their effects on the ocean. The new program in July 1963 was in the design and planning phase of an investigation which will lead to a two-year, multiple-ship field operation beginning in 1965. This is planned to become a cooperative venture of Government agencies concerned with the sea and others interested in trade wind zone problems. Preliminary cruises are planned for early 1964 by the Bureau's new research vessel now under construction.

As a result of the investigation, an understanding will be gained of the seasonally changing processes which govern the distribution of surface-water properties. Knowledge will be gained about the effects of the seasonally changing trade wind system on water motion, distribution of the surface mixed layer, and on the thermocline. Such new knowledge is, of course, basic to ecological studies, in addition to forecasting favorable or unfavorable fishing conditions with assurance in Hawaiian waters. Most far-reaching, however, the results will provide an important link in understanding the ocean-atmosphere heat engine mechanism which controls our climate and so will be a step closer to eventual forecasting of climatic trends both in the ocean and atmosphere.

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JOHNS HOPKINS UNIVERSITY AWARDED GRANT FOR RESEARCH VESSEL:

For the construction and outfitting of an oceanographic research vessel (a double-hulled 150-ton catamaran), the Johns Hopkins University in July 1963 was awarded a grant of $1,291,200 by the National Science Foundation. The vessel will be used by the University's Chesapeake Bay Institute to expand its oceanographic studies in the Chesapeake Bay and Atlantic coastal waters. The Director of the Institute said that the new ship "will enable us to do work in the open bay itself in almost any weather conditions, and will also enable us to work offshore to the edge of the continental shelf.

"We plan to extend our operations up and down the coastline farther than is now possible."

The floating laboratory must be designed and built to exact specifications needed for Chesapeake Bay studies. In general, it will have an over-all length of 99 feet 5 inches, a displacement of 114 tons, and full load of 150 tons.

The six-foot shallow draft will allow operations in shallow inshore areas where conventional vessels cannot venture.

The research vessel will have a cruising speed of about 18 knots, and a range of 1,000 miles with 30 days' supplies and water aboard.

There will be space for a crew of 8 and adequate accommodations for 8 scientists.

The main deck laboratory, plus scientific office space, will be 500 square feet, with at least 700 square feet of open scientific working space.

Johns Hopkins scientists will spend the next year on detailed plans of design, and another year will be needed for construction

after tests have been made on the final design.

Explaining the need for construction of a vessel rather than the purchase of a conventional vessel, the Director of the Chesapeake Bay Institute said that the requirements for sea-keeping characteristics and roll stability for scientific investigation are critical.

In addition, much higher speed is required for coastal and inshore studies than for deep-sea research, because of the much more rapid time changes which occur in the physical, chemical, and biological properties of inshore and coastal waters.

Established 13 years ago, the Institute has been studying the physical, chemical, and biological oceanography of estuarine and inshore environments and has developed improved methods of using serial oceanographic observations to describe the physical and chemical properties of world oceans. In addition, the staff has carried out a program of graduate education and special training of oceanographers.

The Hopkins scientists now use their original research vessel, the Maury, only 65 feet long with a displacement of only 40 tons loaded.

The iron-hulled Maury is operated by a crew of 3 and accommodates only 4 scientists. The size and seaworthiness has limited the field operation of the staff, and weather limits its use on the Bay to approximately one-third of the year.

Oysters

MARYLAND SPATFALL OBSERVATIONS FOR 1963 CONTINUED:

Good sets of oysters generally continued in the Chesapeake Bay area through the mid-summer period, according to the August 22, 1963, "Oyster Report" from the Biological Laboratory of the State of Maryland, Solomons. The set in St. Marys River not only was the heaviest observed but was sustained over the longest period. Fair sets in Tar Bay and in Holland Straits, two important seed areas, occurred on test shells during the two weeks before August 22. In Eastern Bay and the Little Choptank a second wave of heavy setting occurred during the last week in July and first week in August. Upper Harris Creek and upper Honga River both received heavy sets during the last half of July and the first week in August.

The U. S. Bureau of Commercial Fisheries Laboratory at Oxford exposes test shells in Tred Avon River and in Broad Creek, Talbot County, the latter an important seed area. Their report shows that a good set occurred with two distinct waves of setting, one near the beginning of July and the second after mid-July. Test shells were first put out on June 13, 1963, in Tred Avon River and June 14, 1963, in Broad Creek. This year 24 shells were placed in each bag. The inner faces of 12 shells faced downward and the inner faces of the other 12 shells faced the surface. The bags were suspended just off the bottom in such a manner that this shell position was retained throughout the sampling period. New shell bags were suspended weekly and the counts recorded are the total spat found per 24 inner shell faces at each station.

In interpreting test-shell data it must be kept in mind that the figures show the potential set and not the commercial set on planted shells. The position of planted shells and the extent to which they become silt covered or fouled by growths of other organisms may greatly reduce the spat that can attach. Also the crowding of spat by one another as they grow will rapidly lower the count of heavy sets after they have attached.

Although the commercial set will not be evaluated until late fall it is apparent that quite high-count seed should be available in a number of areas in mid-summer. The week before August 22, observers of the Tidewater Fisheries Natural Resource Institute clam survey team brought in soft-shell clam (mannose) shells that were left on the bottom by hydraulic clam dredging in the Eastern Bay area. These were heavily encrusted with young oyster spat 1/4-inch or less in length. Quantities of these thin clam shells were reported on sandy shoal areas where they are likely to be buried by the first severe storm. If a way could be found of salvaging these they would make valuable seed.

In many regions seed oysters often are transplanted when only a few weeks old. Young spat crush easily and dry out quickly, but if handled carefully can be transplanted quite successfully at any time except just before or during the winter months when they are unable to make growth or adjust to their new positions. This year Maryland could make great gains in oyster production if some mechanism could be worked out for transplanting the heavily set young spat to good growing grounds at once or during early fall. If left in seed areas many will have died by spring and the survivors deformed by crowding.

An advantage enjoyed by Maryland in using spat as seed is the lack of a drill problem except in parts of Somerset County and on the Seaside. Spat are so heavily fed upon by drills that it is useless to plant them where drills occur. The fact that most Maryland waters are drill free is one that should be capitalized upon through effective use of dense sets of young spat whenever they are available.

Salmon

COLUMBIA RIVER FISH HATCHERY EVALUATION PROGRAM:

Aerial-Ground Tabulation of Fall Chinook Sport Fishery: In mid-August 1963, the Columbia River fish hatchery evaluation program was expanded to include an aerial-ground tabulation of the sport fishery in the

Columbia River for fall chinook salmon. This is part of a 10-year evaluation program known as "Operation Fin Clip" being conducted by the U. S. Bureau of Commercial Fisheries and cooperating State agencies.

Chinook Salmon

The purpose of the program--which involves the marking of approximately 32 million fish over a 4-year period--is to evaluate the contribution made to the commercial and sports catch of fall chinook salmon by Columbia River hatcheries. The Federal Government, which contributes about $2 million annually for operation and maintenance of 22 State and Federal fish hatcheries on the Columbia and its tributaries, wants to find out how valuable they are to the total fish catch. State agencies cooperating in the program have trained observers stationed at key fishing spots along the Pacific coast from San Francisco, Calif., to Alaska to tabulate the marked fish as they are caught by commercial and sport fishermen.

Statistical sampling techniques used to study the Columbia River sport fishery during August and September 1963 included a count of fishermen in the following areas: (1) from the Interstate Bridge at Longview to Martin's Bluff, including the lower Cowlitz River; (2) from Martin's Bluff to the Lewis River mouth and up the Lewis River to the Lewis River Hatchery; and (3) the vicinity of Bonneville Dam.

Two observers in boats were assigned to each of the first two areas, and one to Bonneville Dam. In addition, an aerial observer in a chartered plane covered the three designated sampling areas and make a general survey of other areas of the Columbia River from Tongue Point to the Klickitat River above Bonneville.

The surface observers operating in boats distributed to fishermen in the sampling areas post card questionnaires issued by the Washington State Department of Fisheries. The questionnaires asked the fishermen to supply information regarding the time and location of their fishing activity and the numbers and kinds of fish caught.

Describing the study, a representative of the Bureau of Commercial Fisheries said, "Personnel of our Bureau and the State agencies have devised a statistically sound sampling schedule to determine the magnitude of the Columbia River fall Chinook salmon sport fishery and at the same time indicate the total number of fish which are being taken and the proportion of marked fish, so we can calculate the contribution made to this fishery by the various hatcheries."

In subsequent years, the survey will concentrate on additional areas of the Columbia River.

Note: See Commercial Fisheries Review, Sept. 1963 p. 45.

* * * * *

MIDDLE SNAKE RIVER AREA FISHERIES IMPROVEMENT PROJECTS:

The construction of fishways, screening of irrigation canals, and clearance of stream obstacles in the Middle Snake River area in Idaho is an important part of the Columbia River Fishery Development Program of the U. S. Bureau of Commercial Fisheries. The Program is designed to improve salmon runs in the Columbia River and its tributaries under cooperative financial arrangements between the Federal Government and the States of Oregon, Washington, and Idaho. Salmon which are hatched in the Middle Snake region in Idaho make their way down the Columbia River to the Pacific Ocean and eventually return to their place of birth as adult spawners.

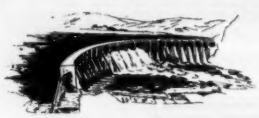
Major improvements in the Middle Snake River area include the Selway Falls fishway on the Selway River about 100 miles above Lewiston, Idaho, and the Lewiston Dam fishway on the Clearwater River at Lewiston, Idaho. At Lewiston Dam, a private power company, in cooperation with the Columbia River Fishery Development Program, is rebuilding outmoded fish ladders that were originally constructed in the 1920's. The total cost of the project is $200,000. At Selway Falls, a tunnel-type fishway is being constructed at a cost of about $250,000. It will pass fish around the falls which have been blocking the movement of Chinook salmon upriver. The two projects are expected to be completed in 1964.

The screening program in the Middle Snake area involves placing screens across irrigation canals to stop fish from entering the canals. The screens are equipped with either electrically-powered or water-driven scrapers

which operate like an automobile windshield wiper to keep the screens free of debris so water can flow through. A total of 166 screens have been installed in the Upper Salmon River Basin in Idaho since the program started 6 years ago. On the Lemhi River (a tributary of the Salmon River where 82 screens have been placed, the spring chinook run has improved from a meager handful of salmon a few years ago to at least 2,000 fish in 1962.

In the Clearwater River, there has been a vigorous clearance program to remove log jams and level minor falls which had impeded the progress of fish.

The over-all Columbia River Development Program has resulted in the construction of 56 fishways and 544 screens in Oregon, Washington, and Idaho. It has also provided financing for 21 fish hatcheries in the 3 states and led to the clearance of 1,500 miles of streams.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, AUGUST 1963:

Item and Period	1963	1962	1961	1960	1959
	..... (1,000 Lbs., Heads-Off)				
Total landings, So. Atl. and Gulf States:					
October	-	14,699	12,696	21,688	19,601
September	-	13,182	9,691	18,832	18,330
August	18,600	12,332	10,944	20,441	18,595
July	16,081	12,283	10,500	21,746	17,493
January-June	39,000	32,111	31,030	36,775	35,511
January-December	-	105,779	91,396	141,035	130,660
Quantity canned, Gulf States 1/:					
October	-	4,454	2,065	2,480	2,324
September	-	1,727	598	2,222	1,936
August	2,900	1,333	1,090	4,427	2,228
July	4,244	3,551	2,793	5,802	2,833
January-June	9,657	7,538	4,963	9,034	10,043
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/:					
October 31	-	21,315	17,811	31,209	33,057
September 30	-	12,843	13,361	24,492	26,119
August 31	3/	12,754	12,728	20,171	23,780
July 31	4/25,460	13,677	14,849	17,397	22,352
June 30	4/24,047	13,796	19,416	15,338	19,283
May 31	4/25,114	13,904	24,696	17,540	21,137
April 30	4/24,954	15,637	27,492	20,502	23,331
Imports 5/:					
October	-	18,279	16,813	14,211	15,340
September	-	9,696	8,629	8,190	7,541
August	3/	7,381	6,743	6,406	5,107
July	11,002	8,265	6,635	7,319	7,861
January-June	70,485	64,001	57,168	51,365	49,826
January-December	-	141,384	126,268	113,418	106,555
	...(¢/lb., 26-30 Count, Heads-Off)...				
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
November	-	84.5	73.5	54.0	46.2
October	-	90.0	68.7	53.0	44.4

(Table continued on next column)

Item and Period	1963	1962	1961	1960	1959
	.. (¢/lb., 26-30 Count, Heads-Off) ..				
September	-	90.9	70.1	52.2	46.4
August	6/ 57-71	83.6	66.1	52.0	46.9
July	6/ 57-78	82.1	55.8	54.6	49.2
June	6/ 72-83	84.4	53.7	64.1	60.7
May	6/ 80-86	83.7	52.8	62.9	63.3
April	83.6	82.2	55.4	60.6	65.2
Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:					
November	-	105-110	89-92	69-73	60-65
October	-	108-115	83-90	69-73	59-62
September	-	113-118	87-90	65-70	62-64
August	75-81	110-112	76-91	64-67	62-64
July	80-97	3/	70-75	72-77	62-74
June	95-102	102-104	67-72	76-77	73-74
May	98-103	96-103	67-69	74-77	70-76
April	100-105	94-97	69-70	74-75	75-82

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Not available.
4/Inventory of Apr. 30, 1963, includes 545,000 pounds; May 31, 1963, includes 553,000 pounds; June 30, 1963, includes 667,000 pounds; and July 31, 1963, includes 925,000 pounds for firms not reporting previously.
5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
6/Range in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: Data for 1963 are preliminary. August 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

Transportation

DIRECT RAIL SHIPMENT OF FROZEN FISH FROM SOUTHEASTERN ALASKA TO OTHER STATES:

Additional direct rail movements of frozen fish out of Alaska over the new car ferry linking Saxman (Ketchikan), Alaska, and the lower 48 states have been reported as of August 1963. A carload of frozen fish, which weighed over 61,000 pounds, moved from Saxman, Alaska, to Miami, Florida. Freight charges amounted to about 3.4 cents a pound. This is considerably lower than charges for shipments by water to Seattle and thence by rail to Miami.

Another car, containing over 82,000 pounds of frozen fish, also left Saxman bound for Cincinnati. This shipment was the second of its kind between those two points. Additional cars have moved to Chicago, Louisville, and other cities.

Tuna

BLUEFIN TAGGING PROGRAM OFF CALIFORNIA RESUMED:

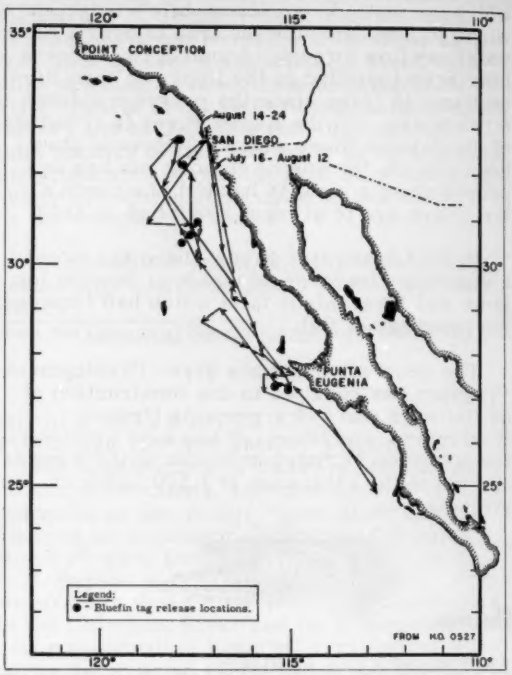
M/V "Elsinore" (July 16-August 24, 1963): The second of a series of annual tagging cruises designed to provide vitally needed information on the Pacific bluefin tuna (Thunnus thynnus), such as age, growth, movements, and vital statistics was completed by the chartered research vessel Elsinore. Specific objectives of this cruise included: (1) the tagging and release of bluefin tuna, (2) collection of serological materials for subpopulation analysis, (3) length-frequency samples of the individual catches, (4) collection of bathythermograph data relating catch success to thermocline depth and magnitude, and (5) collateral oceanographic and meterological observations. This latest cruise successfully extended the area of tag releases from Turtle Bay, Baja California, Mexico, to the Southern California offshore waters as shown in the chart.

The Elsinore was chartered by the U. S. Bureau of Commerical Fisheries Biological Laboratory at San Deigo in cooperation with the California Department of Fish and Game. It is a continuation of the pilot program carried out in August 1962 by the commercial purse-seiner West Point. That vessel was then chartered by the Bureau in cooperation with California's Department of Fish and Game.

A total of 543 bluefin tuna were tagged and released between July 19 and August 19, 1963, as shown in the table.

Blood samples (total of 342) were taken from individual bluefin tuna and transshipped to the Tuna Subpopulation Study group, the Bureau's Biological Laboratory, at Honolulu, Hawaii, for serological analyses.

Supplementary data obtained on this cruise included 69 bathythermograph casts at or near the time the purse seine was fished, length-frequency data from all catches, and daily synoptic marine meteorological observations at 0000, 1200, and 1800 Greenwich Mean Time.



Shows area of bluefin tuna tag releases during M/V Elsinore cruise, July 16-August 24, 1963.

Of particular interest this year was the difficulty encountered by the purse-seine fleet in successfully stopping schools of bluefin tuna once they were surrounded by the net. The Elsinore's experience on this cruise was typical of the commercial tuna-fishing fleet's experience--of 33 sets on schools which were known to be bluefin tuna, only 7 were successful in stopping the fish and holding them until

Bluefin Tuna Tag Release Data from M/V Elsinore Cruise, July 19-August 19, 1963

Date	Time (PDST)	Position		No. of Fish Released
		Latitude	Longitude	
July 19	6:34 - 6:55 p. m.	27° 10' N.	115° 10' W.	76
July 26	4:55 - 6:45 p. m.	27° 14' N.	115° 32' W.	112
August 10	2:30 - 5:50 p. m.	30° 43' N.	117° 43' W.	55
August 10	10:10 p. m. -12:10 a. m.	30° 27' N.	117° 47' W.	77
August 11	11:50 a. m. - 2:50 p. m.	31° 03' N.	117° 35' W.	122
August 12	7:55 -11:00 a. m.	32° 10' N.	117° 52' W.	37
August 19	3:00 - 5:55 p. m.	32° 48' N.	118° 03' W.	64
Total				543

the purse rings were hoisted aboard. All large schools of bluefin in the southern area of this year's fishery frequented very clear water, having such transparency that the fourth 5-fathom-deep strip of seine webbing could be seen below the surface when the net was fished. The schools appeared exceedingly wary and swerved away from the boat upon approach, requiring towline distances varying from 50 to 300 yards to close the gap between net and skiff (the M/V Elsinore fishes a net measuring approximately 485 fathoms long by 40 fathoms deep). Even when the towline was hauled and the fish were still inside the net, over half of the schools were lost as the fish sounded and went under the leadline during the pursing operation.

Of additional scientific interest were the following species taken by the purse seine: a pelagic sting ray (family Dasyatidae), hammerhead shark (Sphyrna lewini), silvertip shark (Carcharhinus platyrhynchus), blue shark (Prionace glauca), broadbill swordfish (Xiphias gladius), striped marlin (Makaira andax), dolphin (Coryphaena hippurus), sunfish (Mola mola), and frigate mackerel (Auxis thazard).

Scientific personnel aboard the M/V Elsinore during this cruise consisted of 2 fishery biologists from the Bureau's San Diego Biological Laboratory and 2 marine biologists of the California Department of Fish and Game.

Note: See Commercial Fisheries Review, December 1962 p. 50.

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BLUEFIN TUNA TAGGED IN NORTH ATLANTIC OFF CAPE COD RECAPTURED NEAR RHODE ISLAND COAST:

The second tag return from bluefin tuna tagged and released in the North Atlantic by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware was taken August 23, 1963, by a tuna purse-seine vessel operating off Block Island, R. I. The tuna was tagged and released 150 miles southeast of Cape Cod on June 8, 1963, along with 28 others of the same species, and traveled 145 miles to the northwest before its recapture 77 days later. In addition, three more tagged bluefin tuna are believed to have been recaptured by purse-seine vessels operating in the same area. Canning plants were alerted to watch for those fish in an effort to recover the tags.

The first tag return from the bluefin tuna released by the Delaware was found in a purse-seine catch 20 miles off Ocean City, Md., on June 27.

Note: See Commercial Fisheries Review, August 1963 pp. 36-40 and p. 53.

U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JULY 1963:

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, July 1963 with Comparisons

Area (Home Port)	July 1963	July 1962	Jan.-July 1963	Jan.-July 1962	Total 1962
	(Number)				
Issued first documents 2/:					
New England	4	5	14	20	28
Middle Atlantic	4	-	12	2	3
Chesapeake	9	2	31	23	43
South Atlantic	11	4	44	21	47
Gulf	20	9	135	62	110
Pacific	28	13	136	100	130
Great Lakes	-	-	3	1	5
Puerto Rico	-	-	3	-	2
Total	76	33	377	229	368
Removed from documentation 3/:					
New England	7	1	33	12	24
Middle Atlantic	12	-	39	26	39
Chesapeake	2	5	12	13	23
South Atlantic	3	4	37	22	38
Gulf	14	10	76	69	104
Pacific	9	3	60	72	111
Great Lakes	-	-	9	12	22
Hawaii	-	-	1	3	3
Puerto Rico	-	-	-	1	1
Total	47	23	267	230	365

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, July 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	16	17
10-19	19	16
20-29	6	4
30-39	6	1
40-49	11	3
50-59	2	2
60-69	3	1
70-79	8	1
80-89	1	-
90-99	1	1
100-109	1	-
130-139	-	1
140-149	1	-
150-159	1	-
Total	76	47

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes 5 redocumented vessels in July 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 52 in 1963; 1 in 1962; 1 in 1958; 1 in 1951; 20 prior to 1951; and 1 unknown.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

During July 1963, a total of 76 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 33 in July 1962. There were 47 documents cancelled for fishing vessels in July 1963 as compared with 23 in July 1962.

U.S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1963:

United States imports of edible fishery products in 1963, in general, reflect the comeback of the Maine sardine fishery this season by the drop in imports of canned sardines in-oil; the sharp drop in demand for canned tuna in the second quarter of this year by the substantial decline in imports of frozen tuna; and the strong United States demand for shrimp by the higher imports of frozen shrimp.

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in July 1963 were up 14.1 percent in quantity and 17.0 percent in value from the previous month. In July, imports were much higher for groundfish fillets (increase mostly from Canada), fresh swordfish from Canada, and canned tuna in brine from Japan. Imports were also up for halibut and salmon fillets from Canada, canned crab meat from Japan, canned oysters from Japan, frozen frog legs from Japan, and frozen shrimp. The increase was offset partly by a sharp drop in arrivals of frozen tuna, and lower imports of northern lobsters from Canada.

Compared with the same month in 1962, imports in July 1963 were down 7.7 percent in quantity, but about the same in value. This July there was a heavy cutback in imports of frozen tuna. Imports were also down for cod fillets, canned sardines (in-oil and not-in-oil), and canned salmon. But imports were up for fresh swordfish, canned albacore tuna in brine, frozen shrimp, sea scallops, and groundfish fillets (other than cod fillets).

In the first 7 months of 1963, imports were down 5.4 percent in quantity and 2.5 percent in value. Fluctuations in individual import items were much greater than the over-all totals indicate. Imports were down sharply in 1963 for canned tuna in brine, frozen tuna, canned sardines in oil, frozen spiny lobsters, and canned salmon. On the other hand, there was a large increase in imports of canned sardines not-in-oil (mostly from South Africa Republic) and frozen shrimp, as well as heavier shipments of ocean perch fillets, blocks and slabs, fresh swordfish from Canada, canned crab meat from Japan, and frozen frog legs from India.

U. S. Imports and Exports of Edible Fishery Products, July 1963 with Comparisons

Item	Quantity				Value			
	July		Jan.-July		July		Jan.-July	
	1963	1962	1963	1962	1963	1962	1963	1962
	(Millions of Lbs.)				(Millions of $)			
Imports:								
Fish & Shellfish:								
Fresh, froz. & processed 1/	96.0	104.0	627.5	663.7	35.1	35.0	220.5	226.1
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen	1.8	2.1	18.4	19.5	1.0	1.0	7.6	7.9

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed fish and shellfish from the United States in July 1963 were down 10.0 percent from those in the previous month, but the value of the exports was the same in both months. The decline in quantity affected all the leading canned fish items exported by the United States except the higher-priced canned shrimp which showed a considerable gain in July.

Compared with the same month in 1962, the exports in July 1963 were down 14.3 percent in quantity, although the value of the exports was again the same in both months. A sharp drop in exports of canned sardines (not in oil) and canned mackerel this July was offset by larger shipments of canned shrimp and canned squid.

Processed fish and shellfish exports in the first 7 months of 1963 were down 5.6 percent in quantity and the value dropped 3.8 percent from the same period in 1962. The drop in value was due to a general decline in the price of canned fishery products in 1963. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of canned salmon and canned squid and in particular canned shrimp which increased 48.6 percent from the same period in 1962. Although not covered in the table, exports of frozen shrimp were up sharply in the first 7 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

* * * * *

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, JULY 1963:

United States imports of fish meal and scrap in July 1963 totaled 43,223 short tons, a gain of 134.2 percent from the 18,452 tons imported in the previous month, and an increase of 67.2 percent from the 25,857 tons imported in July 1962.

About 77.2 percent of the fish meal and scrap imports in July 1963 entered through the Customs Districts of Georgia, Mobile

U. S. Imports of Fish Meal and Scrap by Customs Districts, July 1963

Customs Districts	July 1963
	Short Tons
Maine and New Hampshire	352
New York (N. Y.)	1,102
Philadelphia (Pa.)	100
Maryland	661
North Carolina	772
Georgia	4,964
Mobile (Ala.)	4,961
New Orleans (La.)	1/1,488
Sabine (Tex.)	557
Galveston (Tex.)	2,579
Los Angeles (Calif.)	2/4,295
San Francisco (Calif.)	6,013
Washington	4,892
Hawaii	8,262
Dakota	257
Duluth (Minn.) and Superior (Wis.)	1,538
Michigan	188
Other Customs Districts	3/ 242
Total	43,223

1/Includes 1,488 tons of fish meal classified as fertilizer.
2/Includes 833 tons of fish meal classified as fertilizer.
3/Includes 30 tons of fish meal classified as fertilizer.

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free of charge by writing to the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233.

(Ala.), Los Angeles (Calif.), San Francisco (Calif.), Washington, and Hawaii.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, AUGUST 1963:

Wholesale price trends moved downward in August 1963 for the third month in a row starting in June in accordance with the usual seasonal trend. The 4.1-percent drop from July to August was due largely to lower prices for processed fresh and frozen fish and shellfish, and somewhat lower prices for canned fish products. Prices this August were generally lower than those in July in all of the subgroups except those under drawn, dressed, or whole finfish which were substantially higher. Compared with a year earlier, the index this August at 105.5 was down 13.2 percent. Supplies of a number of the major fishery products were more plentiful this August than a year earlier with fresh and frozen shrimp in the forefront, followed by several of the canned fish items.

At New York City, lighter August supplies of fresh dressed western halibut and king salmon resulted in higher prices for those products. Because of those higher prices (halibut up 7.0 percent and salmon up 5.6 percent), the subgroup index for drawn, dressed, or whole finfish jumped 5.5 percent from July to August. Prices this August also were higher for ex-vessel large haddock at Boston (up 1.4 percent) and Great Lakes fresh-water fish at Chicago and New York. But compared with the same month a year earlier, a more plentiful supply of most products caused the subgroup index this August to drop 11.9 percent. Prices for all items in the subgroup were sharply lower than in August 1962 except Great Lakes whitefish and yellow pike which were up 25.6 and 28.0 percent, respectively.

As in the previous month, there again was a sharp drop from July to August in fresh shrimp prices at New York City (down 23.2 percent) because of better supplies from the South Atlantic States. These lower prices contributed significantly to the 13.5-percent drop during the same period in the subgroup index for processed fresh fish and shellfish. Prices this August also were lower for shucked standard oysters at Norfolk (down 5.9 percent) and fresh haddock fillets at Boston (down 2.6 percent). As compared with the same month in 1962, the subgroup index this August was down 11.1 percent chiefly because of lower prices for fresh shrimp. A year earlier, shrimp supplies were very light and wholesale prices were about 40 percent higher than this August.

The lower price index for processed frozen fish and shellfish (down 8.3 percent) from July to August also was influenced principally by sharply lower shrimp prices. At Chicago, frozen shrimp prices dropped 15.1 percent (from 93 to 79 cents a pound). Compared with the same month a year earlier, frozen shrimp prices this August were 27.3 percent lower because of more liberal supplies. From July to August there was a slight decline in prices for frozen flounder fillets (down 1.2 percent), but small haddock fillets were up

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Aug. 1963	July 1963	Aug. 1963	July 1963	June 1963	Aug. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					105.5	110.0	114.4	121.6
Fresh & Frozen Fishery Products:					108.0	114.3	120.5	124.3
Drawn, Dressed, or Whole Finfish:					116.0	110.0	109.7	131.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.11	84.6	83.4	97.9	109.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.39	.36	113.8	106.4	106.4	138.9
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.93	.88	129.2	122.3	118.8	146.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.66	.59	98.5	88.0	84.3	78.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.64	.62	104.8	100.7	76.2	81.9
Processed, Fresh (Fish & Shellfish):					104.5	120.8	135.1	117.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.38	.39	91.1	93.5	100.8	89.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.70	.91	82.0	106.7	133.0	114.3
Oysters, shucked, standards	Norfolk	gal.	8.00	8.50	134.9	143.3	143.3	126.5
Processed, Frozen (Fish & Shellfish):					98.9	107.9	113.1	117.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	98.9	100.1	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.36	.35	105.5	102.6	102.6	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.33	115.7	116.6	117.5	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.79	.93	93.1	109.7	118.6	128.1
Canned Fishery Products:					101.6	102.8	104.1	117.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.00	24.00	104.8	104.8	104.8	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.88	11.15	96.8	99.0	99.9	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.75	5.90	97.5	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.11	8.11	104.0	104.0	113.0	119.4

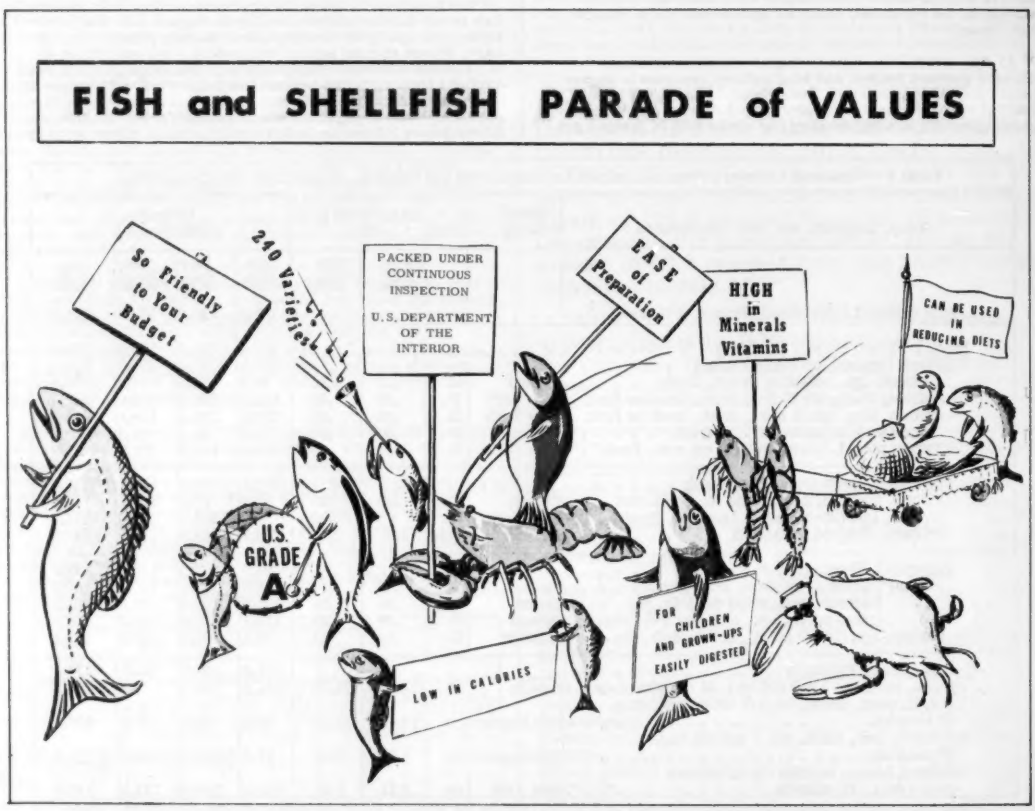
1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/ Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-August 1963.

2.8 percent. August prices for ocean perch fillets declined only fractionally from those of the previous month, but they were up 10.0 percent from August 1962. The subgroup index this August was 16.0 percent below the same month a year earlier principally because of the substantially lower shrimp prices.

Prices for canned Maine sardines and canned pink salmon this August were unchanged from the previous month. The slight drop from July to August in the canned fishery products subgroup (down 1.2 percent) was due to lower prices for canned tuna and canned jack mackerel. The California canned tuna pack as of the end of August 1963 was substantially below that of the same period a year earlier but did not create any supply shortage as the carryover from the 1962 pack was liberal and the demand during the second quarter of 1963 was below normal. Compared with August 1962, prices this August were sharply lower (down 13.5 percent) because of still liberal stocks of all canned fishery products.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International

EUROPE

WEST EUROPEAN FISHERIES CONFERENCE SCHEDULED FOR OCTOBER 1963:

A West European Fishery Conference is scheduled to take place at Esbjerg, October 9-10, 1963. (Originally it was scheduled for September 11-12, 1963.) About 65 participants from 10 West European countries are expected. They will discuss problems involved in the extension of fishery limits, a common fishery policy in Common Market and EFTA countries, and technical matters such as the carrying of lights on vessels, destruction of gear by other vessels, crew quarters, etc. Denmark's recent experience with minimum price regulations also may be included. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 7, 1963.)

Note: See Commercial Fisheries Review, June 1963 p. 59.

EUROPEAN ECONOMIC COMMUNITY

DELAY SOUGHT IN PROPOSED WESTERN EUROPEAN FISHERIES CONFERENCE:

The European Economic Community (EEC) countries seek a delay of some months in the proposed Western European Fisheries Conference on access to fishing grounds and markets initiated by the United Kingdom and scheduled to take place in London in the fall of 1963, according to a July 26 report in a Copenhagen newspaper. The Common Market countries wish to wait until the end of the year in order that they may begin to develop their own common fisheries policy. At a meeting in Brussels, representatives of the six EEC Governments discussed, for the first time, the British proposal for the conference and agreed, in principle, that the EEC countries should participate, but an official response has not yet been made to the British invitation.

The permanent representatives in Brussels will discuss the question later, and it is expected that the European Common Market Commission, by the end of the year, will present the first proposal for a common fisheries policy to the Council of Ministers. The Common Market has no common policy on access to fishing grounds and access to markets, the matters to be discussed at the United Kingdom Conference.

France has the most reserved position among The Six, believing that there cannot be realistic discussions with third countries before The Six are in mutual agreement. In addition, France believes that organizing markets for fish and fish products is a question better suited to solving during next year's tariff discussions at GATT rather than at the London conference.

The French position comes as no surprise to other EEC and to European Free Trade Association (EFTA) fishery representatives. Earlier efforts to establish an EEC fisheries policy have failed because of France's unwillingness to have non-EEC nations participate in any way at a policy development meeting, and the desire of most of the other EEC countries that fishing nations such as the United Kingdom, Norway, and Denmark should be present as observers. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, July 31, 1963.)

EUROPEAN FREE TRADE ASSOCIATION

FORMAL DECISIONS ADOPTED AT MEETINGS OF EFTA COUNCIL:

At the 16th and 17th meetings of the European Free Trade Association (EFTA) Council held in May 1963, nine Decisions (Decision Nos. 6 to 14) were adopted in accordance with articles of the Stockholm Convention.

Decisions concerning (1) acceleration of the Convention timetable for the elimination

International (Contd.):

of import duties, (2) acceleration of the elimination of quantitative import restrictions, and (3) establishment of an Economic Development Committee, which were adopted at the Council's 16th meeting on May 10, follow:

Decision No. 6: Acceleration of the Convention timetable for the elimination of import duties. The Council decided that the timetable in paragraph 2 (a) of Article 3 of the Convention for the elimination of the final 50 percent of the import duties concerned should be replaced by the following revised timetable:

December 31, 1963: reduction to 40% of the basic duties.

December 31, 1964: reduction to 30% of the basic duties.

December 31, 1965: reduction to 20% of the basic duties.

December 31, 1966: complete elimination of the import duties concerned.

Decision No. 7: Acceleration of the elimination of quantitative import restrictions. The Council decided to advance to December 31, 1966, the date in paragraph 2 of Article 10 of the Convention by which quantitative import restrictions on intra-EFTA trade in industrial goods should be eliminated. As a consequence of this, the date January 1, 1970, in paragraph 3 of Article 10 was changed to January 1, 1967.

Decision No. 9: Establishment of an Economic Development Committee. The Council decided to establish an "Economic Development Committee" to examine such questions in relation to economic development in Member States as the Council may refer to it, including questions in this field relating to circumstances created by the dismantling of trade barriers between Member States, and in appropriate cases to study the ways and means of promoting or facilitating collaboration among them in financial, technical and similar matters. The Committee is required to submit a report as soon as possible, and in any case before July 1, 1964. (EFTA Bulletin, July 1963.)

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

DIVISION OF 1963 PINK SALMON CATCH CONSIDERED:

The International Pacific Salmon Fisheries Commission met on August 20, 1963, to consider the serious problem involved in the division of the 1963 pink salmon catch in North Pacific Convention waters between the fishermen of Canada and the United States. Canadian fishermen had harvested only 840,000 pink salmon to that date in Convention waters as compared with 1,460,000 fish by United States fishermen for the same period ending August 19. Reports to the Commission for August 19 revealed that the day's catch showed a gain for United States fishermen with their catch at 215,000 pink salmon while the Canadian catch was only 155,000 fish.

The main Fraser River run was not expected to start until the last week in August when the Puget Sound run would be tapering off in Convention waters. "We can only hope to fullfill our obligation under the Pink Salmon Convention, of dividing the pink salmon catch, by further adjustment of the fishing regulations at that time," the Chairman of the Commission announced.

The Commission added one extra day to the fishing period for Canadians fishing the Juan de Fuca Strait area the week of August 11 and decided on August 20 to extend the Canadian fishing time to a total of five days for the week of August 18 in Juan de Fuca Strait only.

It was hoped that the added fishing time in the specified Canadian waters would aid in closing the gap between the catches of the two countries. The Commission planned to meet again on August 23 to review the entire situation.

* * * * *

PROPER HARVEST PLANNED FOR PINK SALMON RUN IN NORTH PACIFIC CONVENTION WATERS:

The Commission met with its Industry Advisory Committee again on August 23, 1963, to work out a plan for the proper harvesting of the pink salmon run destined for both Puget Sound Rivers and the Fraser River.

International (Contd.):

A large run of pink salmon to Puget Sound Rivers has returned this year and the harvesting of that run has created a serious problem in obtaining the required division of the catch between the two countries without overfishing the Fraser River pink run.

Staff reports indicated that the severe regulatory restrictions imposed in 1961, to protect the Fraser River run, badly decimated by high water in the brood year, had brought a return to Puget Sound Rivers greater than that for many years. The problem of escapement, therefore, is not as difficult for those streams as for the Fraser River run which has not yet been brought to maximum production.

The Commission Chairman told the Commission's Advisory Committee that the Commission could not allow overfishing of the Fraser run to make up any deficit in the Canadian catch caused by the Puget Sound run. "Our primary responsibility is to restore the Fraser River pink run to full production while at the same time obtaining a practical division of the catch. When the Fraser River run is restored the problems facing the Commission and the industry this year of dividing the catch will be largely solved."

It was pointed out during the meeting that the 210,000 fish differential in favor of United States troll fishermen over Canadian troll fishermen on the high seas would have to be made up mainly by further regulation of the United States inside net fishery. In past years, the Canadian troll catch has equalled or exceeded that of the United States troll fishermen.

After thorough consideration of the problem of obtaining the required increase in the escapement of Fraser River pink salmon now entering Convention waters in quantity and the suggestions of the Advisory Committee, the Commission ruled that fishing in Canadian Convention waters lying westerly of the William Head-Angeles Point line would not commence for the week beginning August 25 until Monday evening at 6:00 p.m., August 26 for gill nets and 6:00 a.m. Tuesday morning, August 27, for purse seines.

The Commission was scheduled to meet again on August 27 to consider further the regulatory requirements in the various fishing areas for that week.

* * * * *

PINK SALMON FISHING REGULATIONS FOR FIRST HALF OF SEPTEMBER 1963 REVIEWED:

The International Pacific Salmon Fisheries Commission met September 3, 1963, to review the fishing regulations for the first week of September in all Convention waters on the basis of the catch of pink salmon on September 2.

Staff reports indicated that the pink salmon run in the Juan de Fuca Strait area appeared to be declining, that United States catches of early Fraser pinks were not as large as anticipated, but that the number of pink salmon in the Gulf of Georgia had increased favorably.

The West Beach catches of Puget Sound pink salmon continued to be very large on September 2 even though this run had been expected to drop substantially.

The Commission issued regulations in accordance with the findings.

The problem of escapement of early Fraser River pink salmon as related to possible fishing time in the various Convention fishing areas for the week beginning September 8, 1963, was discussed by the Commission when it met September 6 with its Advisory Committee.

Staff reports to the Commission and to the Advisory Committee showed that the number of early run pink salmon available for escapement as delaying fish in the Gulf of Georgia was not yet adequate. It was indicated that the necessary harvesting of the large run of Puget Sound pink salmon had not permitted the usual surplus of Fraser pinks to be taken by the gill-net fishermen operating off the mouth or in the Fraser River proper.

In view of the large 1963 catch of pink salmon (expected to exceed 8 million fish for the fishermen of the two countries), it was agreed that every measure should be taken to assure a satisfactory escapement of pink salmon to the Fraser River.

After considering all of the data presented by its staff and the representation of the Ad-

International (Contd.):

visory Committee, the Commission recommended certain regulatory action for the week commencing September 8.

* * * * *

PINK SALMON REGULATORY PROBLEMS DISCUSSED:

Regulatory problems concerned with the early Fraser River pink salmon run the week of September 1, were considered at an August 30, 1963, meeting of the International Pacific Salmon Fisheries Commission.

Catch figures through the week of August 25 indicated that the problem of the division of the catch between United States and Canadian fishermen was under control at that time and that escapement to the mouth of the Fraser River was the principal problem facing the Commission during the coming fishing period.

Catches in Georgia Strait south of Point Roberts, at Point Roberts, and off the Fraser River had not indicated a satisfactory abundance of early Fraser pink salmon in those areas for that period of the season. The Chairman of the Commission said that the Commission desired a heavy escapement of early Fraser River pink salmon which have extensive spawning grounds available to them. "The later running pink salmon to the Fraser have relatively restricted spawning areas and do not provide any great potential for increased runs to the Fraser River in future years. It is the early run that has the great potential for the future and we must obtain a minimum of 1,500,000 escapement and 2,500,000 would be more desirable."

After considering staff reports, the Commission recommended certain fishing regulations in an attempt to achieve the Commission's objectives.

The Commission also met on August 27 and considered the problem of how to harvest the heavy run of Puget Sound pink salmon escaping the Juan de Fuca Strait fishery.

The Commission staff reported that the first of the Fraser River run had appeared at Point Roberts but that it was too early to assess the actual volume of the Fraser River run. Catches at the entrance to Juan de Fuca Strait on August 27 were reported to be good and troll catches off the West Coast of Vancouver Island indicated that the run would continue for some time.

The Chairman of the Commission said that heavy catches of Puget Sound pink salmon in United States Convention waters was making the division of the 1963 catch of pinks difficult if not impossible. He pointed out the desirability of a heavy early escapement to the Fraser River to rehabilitate this major segment of the run, and that this entailed carefully controlled fishing during the early weeks of the run.

FISH MEAL

WORLD PRODUCTION, JUNE 1963:

World production of fish meal in June 1963 showed little change from that in the same month of 1962, according to preliminary data from the International Association of Fish Meal Manufacturers. Compared with the previous month, production in June 1963 was down 22.4 percent due mainly to lower output in Peru.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World Fish Meal Production by Countries, June 1963

Country	June		Jan.-June	
	1963	1962	1963	1962
	(Metric Tons)			
Canada	5,966	7,471	37,910	43,279
Denmark	11,485	10,641	47,444	38,870
France	1,100	1,100	6,600	6,600
German Fed. Rep.	5,821	3,857	38,949	36,121
Netherlands	1/	200	2/1,600	2,400
Spain	1/	2,236	2/10,869	13,712
Sweden	324	167	3,107	2,496
United Kingdom	6,656	6,787	38,849	37,648
United States	31,295	55,488	3/81,774	3/110,511
Angola	1/	2,483	2/11,174	14,368
Iceland	1/	5,400	2/34,814	32,330
Norway	19,469	10,739	44,488	30,684
Peru	98,657	83,819	701,507	544,442
South Africa (incl. South-West Africa)	34,393	23,600	3/147,997	158,196
Total	215,166	213,988	1,207,082	1,071,657

1/Data not available.
2/Data available only for January-May.
3/Revised.
Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production during the first 6 months of 1963 was 12.6 percent greater than in the same period of the previous year. Production in the first half of 1963 was boosted by much heavier landings of anchoveta in Peru as well as increased landings of industrial fish in Denmark and Norway. But there was a sharp decline in production in the United States.

Peru accounted for 58.1 percent of total fish meal production during January-June 1963, followed by South Africa with 12.3 percent and the United States with 6.8 percent.

International (Contd.):

NORTH PACIFIC FISHERIES CONVENTION

TRIPARTITE TREATY DISCUSSIONS RESUMED AT SECOND MEETING:

Delegates of the three parties (Canada, Japan, and the United States) to the International Convention for the High Seas Fisheries of the North Pacific Ocean met in Tokyo beginning September 16, 1963, to discuss possible modifications of the Treaty.

Preliminary discussions were held in Washington, D. C., June 6-21, 1963, and at the close of those discussions it was decided to recommend to the three governments that a subsequent meeting be held, in an effort to reach agreement on the future course of the Treaty.

The Tripartite Treaty entered into force in 1953. Its objective was to insure the maximum sustainable productivity of the fishery resources of the North Pacific Ocean. The Treaty has a minimum duration of 10 years, which elapsed on June 12, 1963. After that date, any one of the three Governments may terminate the Treaty on one year's notice. The June meeting at Washington originated from a request by the Japanese Government for such discussions.

At the Washington, D. C., meetings it was agreed by the three parties that it would be desirable to give further study to means of resolving the different views of the three countries in the light of the work at that Conference. The Conference then decided to adjourn and recommended to the three Governments that efforts to reach agreement be renewed at a second Conference.

Note: See Commercial Fisheries Review, August 1963 p. 70; July 1963 p. 66.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

JAPAN INVITED TO OECD MEMBERSHIP:

Japan was invited to membership in the Organization for Economic Cooperation and Development by a unanimous vote of the OECD Council on July 27, 1963. The OECD Secretary General notified the Japanese Ambassador to France of the Council's decision, and a memorandum stipulating the terms of Japan's entry into that organization was signed by both those officials. The OECD will formally vote on Japan's admission as the 21st member on November 20, 1963, and the effective date of membership will follow the Japanese Diet's approval. Japan will be requested to contribute approximately $1 million annually to the organization.

The memorandum stipulated that Japan will be granted reservations or exemptions from the 2 OECD codes regarding 17 items, including the long-term chartering of foreign vessels. The Japanese statement which will be incorporated in the memorandum declares Japan's adherence to the terms of the OECD Code of Liberalization of Current Invisible Operations as well as the organ's Code of Liberalization of Capital Movement upon becoming an OECD member. The statement also affirms Japan's preparedness to commit herself to all the obligations derived from her endorsement of those codes.

Japan's Foreign Minister hailed the Council's action, and stated that Japan has exerted painstaking efforts to stabilize and expand the world economy in the United Nations, the International Monetary Fund, the General Agreement on Tariffs and Trade, and the Development Assistance Committee (a subsidiary organ of the OECD). The Foreign Minister added that with the admission to the OECD, Japan's economic policies will be carried out both at home and abroad under closer cooperation with the world economic organization, all of which will enable Japan to contribute in a larger measure to the consolidation of unity among the countries of the Free World and further enhance Japan's international status. (Japan Report, July 31, 1963.)

SOVIET BLOC TRIPARTITE AGREEMENT

COOPERATION IN FISHERIES RESEARCH BY SOVIET UNION, POLAND, AND GERMAN DEMOCRATIC REPUBLIC:

A plan calling for scientific and technical cooperation in fisheries research was approved on March 1, 1963, by fishery officials of the Soviet Union, Poland, and the German Democratic Republic. Those countries had previously signed a tripartite agreement on cooperation in fisheries on July 28, 1962, and established a Joint Committee on fisheries. The plan for cooperation in fisheries research was discussed at the first session of the Joint Committee which met at Rostock in the German Democratic Republic from February 26-March 1, 1963.)

Besides fishery officials from the three countries party to the agreement, the session

International (Contd.):

was attended by 20 delegates and experts of other countries.

The plan, which is to be put into effect immediately after ratification by the governments of the three countries, calls for joint research and an exchange of information in fisheries development work for 1963-1964 such as: (1) estimating fishery stocks and forecasting fishery catches in the main fishing areas for 1964, i.e. the Baltic, North Sea, Northeast Atlantic, Northwest Atlantic, and Central and South Atlantic (off the West African Coast); (2) fisheries exploration and gear research; (3) mechanizing fishing vessels and fish-processing plants; (4) studies in fish processing technology; (5) studies in fishery economics; and (6) expansion of fishing fleets and problems of appropriate operation of ports and fishing fleets.

The program of cooperation was to be realized through direct contacts between scientists and fishing industry representatives, as well as by an exchange of information and statistics. The plan also proposed joint consultations of specialists, and an exchange of fishery technicians.

The Joint Committee, composed of fishery delegates from the three countries, was to hold its second session in Poland before the end of 1963. (Polish Maritime News, vol. VI, no. 56, April 1963, p. 9.)

Note: See Commercial Fisheries Review, August 1962 p. 89.

WHALING

NORWEGIAN GOVERNMENT REJECTS APPLICATION TO SELL WHALE FACTORYSHIP TO JAPAN:

The Norwegian Government is reported to have rejected the application submitted by a Norwegian firm to sell its whale factoryship Thorshovdi to Japan. As a result, Japan is reported to be considering changes in the makeup of her Antarctic whaling fleet for the coming season. She was originally reported to be planning on sending a total of seven whale factoryships.

Japan's international whale catch quota is presently 4,600 blue-whale units. (Suisan Tsushin, August 12; Suisan Keizai Shimbun, July 24, 1963.)

Algeria

FISHERIES OFFICE ESTABLISHED:

Algeria has created a National Office of Fisheries under the jurisdiction of the Ministry of Reconstruction, Public Works and Transport. This office will have the mission of organizing and promoting the fishing industry in Algeria and the sale of its products. These functions will include "promoting and controlling the necessary groups and organizations, especially cooperatives." The office will also be charged with managing boats, canneries, and refrigeration installations declared to be vacated properties. (United States Embassy, Algiers, August 1, 1963.)

Angola

JAPANESE FISH MEAL OPERATION OFF ANGOLA TO BE DISCONTINUED:

The Japanese firm operating the fish meal factoryship Renshin Maru off Angola is reported to have decided not to continue her Angolan fish-meal operations this coming winter. This action was taken after the Angolan firm (with which the Japanese company had contracted for the delivery of fish for processing into fish meal by the factoryship during the previous two seasons) insisted that the Japanese firm enter into a partnership and establish a joint company in Angola. However, in view of the unsettled political situation in Angola, the Japanese firm has decided against the risk of investing capital in that country. (Suisan Tsushin, August 23, 1963.)

Australia

TEAM TO STUDY JAPANESE TUNA METHODS:

To investigate the possibility of further developing tuna resources in waters adjacent to Australia, the Australian Government in mid-1963 provided funds from its Fisheries Development Account.

A team of experts will visit Japan, Hawaii, and American Samoa to investigate the technical and economic aspects of introducing to Australia the deep-sea long-line method of catching tuna.

Australia (Contd.):

Tuna are known to be present in large quantities in the deep waters off the Australian coast, but the types of vessels and gear required to catch them, and especially the cost of such operations, present problems.

The live-bait-and-pole method used by Australian fishermen to catch tuna in the shallow waters close to the coast is not applicable to the deep-water fishery.

It is expected that the investigations will take about three months, and that the experts' report will indicate to the Government and to the fishing industry what are the prospects of successfully developing a deep-water tuna fishery on a commercial basis. (New Zealand periodical Commercial Fishing, July 1963.)

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YELLOWFIN TUNA CAUGHT BY LONG LINE OFF NEW SOUTH WALES:

The first commercial long-lining of yellowfin tuna in Australia was reported in June 1963, as having been successfully carried out between Ulladulla and Eden (New South Wales) by a small group of boats. Their technique, however, differed from Japanese subsurface long-lining in that they fished not far below the surface and in not more than 40 fathoms.

In one week of fishing the boats caught 20 tons of yellowfin tuna, running from 40 to 140 pounds and averaging 80 pounds. One fisherman worked up and down a drifting line. As soon as he saw a float sink, he took the fish aboard and reset the branch line. (Commercial Fishing, New Zealand, June 1963.)

Brazil

FISHERY DEVELOPMENTS, 1963:

As of mid-1963, the Brazilian Government is directing its major efforts in fisheries toward better organizing and developing the industry's resources for the purpose of increasing national consumption of fish. To achieve this purpose, it has plans to modernize the domestic tuna, sardine, cod, and spiny lobster industries.

Besides Government plans, there are two major business developments:

(1) A group of businessmen, including several Americans, is said to be interested in launching a fairly large-scale fishing enterprise in South American waters. According to the report, the group has sought bids on integrated fishing vessels (approximately 10 in number) from the West Germans and the Japanese. The American, European, and Japanese markets are said to be the targets of this venture.

(2) Privately sponsored is the lobster industry of the Northeast. These fisheries, with no special Government concessions, have captured a small share of the frozen spiny lobster tail market in the United States (an estimated $4 million was exported in 1962). The yield of those fisheries will probably grow, although slowly, in the years to come. Also, a small shrimp industry in northern Brazil has as its purpose exportation of frozen shrimp to the United States. (United States Embassy, Rio de Janeiro, August 20, 1963.)

British Honduras

SPINY LOBSTER INDUSTRY:

For reasons of conservation, the British Honduras Government imposes on the spiny lobster fishery a catch quota of 800,000 pounds per season (July 15 to March 15 of the following year). The entire catch is exported. The quota is allocated among the producers.

There is a legal minimum price to be paid to the fishermen of BH$0.25 (17.9 U. S. cents) a pound of whole lobster (30 pounds of tail are equivalent to 100 pounds of whole lobster). In practice, the fishermen receive about BH$0.27 (19.5 cents) a pound; the price usually quoted includes ice and delivery to the buyer's plant, and is, with practically no variation, BHS$0.30 (21.4 cents) a pound, as compared with BH$0.22 (15.7 cents) a pound three years ago.

In view of the fully subscribed quota, prospects for expansion are not great. At present the industry engages only in shallow-water fishing, and the Government is currently studying the feasibility of deep-water spiny

British Honduras (Contd.):

lobster fishing in the hope of being able to increase the catch. A reliable source within the industry, however, reports that attempts already made to catch lobsters in deep water have been disappointing. The same source maintains that effective prohibition of catching female and undersize lobsters, and off-season catching of all lobsters, would abolish the need for any quota restrictions whatsoever. (United States Consulate, Belize, August 16, 1963.)

Note: Values converted at rate of BH$1.40 equal US$1.00.

Chile

GOVERNMENT'S INTEGRATED FISHERIES PLANT:

The Chilean Government's integrated fisheries corporation is now under construction in Iquique. Of its proposed fleet of 18 fishing vessels, 8 will be tuna purse seiners; the other 10 will be smaller vessels for fishing anchovy (anchovette). (United States Embassy, Santiago, August 22, 1963.)

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NEW FISH MEAL PLANT PLANNED:

A modern 25-ton fish-meal plant will be established in Iquique, Chile, by a newly organized subsidiary of a large drug-chemical industries corporation in Panamá (Panama). The entire production will be exported and marketed in the large drug firm's established lines of animal-feed mixes. The company also plans to install at Iquique a small pilot plant for production of fish meal for human consumption.

The entry of this large drug-chemical firm in the fish-meal industry, if interpreted as a breakthrough on the acceptance of fish meal for human consumption, may give new impetus to investment expansion in the industry of Northern Chile. (United States Embassy, Santiago, August 10, 1963.)

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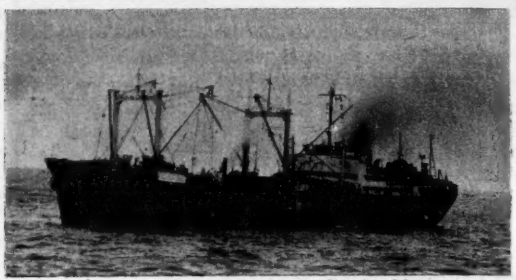
PROSPECTS SLIGHT OF SETTING UP JAPANESE FISH-MEAL OPERATIONS IN CHILE:

A Japanese fishery firm, which had been negotiating for some months with Chilean interests for the establishment of joint fish-meal operations in Chile, was reported to have decided to dispatch the fish-meal factoryship Renshin Maru (14,094 gross tons) to the eastern Bering Sea in 1964 instead. The reason is that prospects of a satisfactory settlement ever being reached with Chile this year are considered very slight. Originally, that company had planned on diverting the Renshin Maru to operate off Chile as soon as settlement was reached.



Japanese fish-meal factoryship Renshin Maru.

The Chilean Government is reported to look favorably on the establishment of the joint company. However, the proposal is said to be strongly opposed by some elements in the Chilean fish-meal industry, and, as a result, the Chilean Government does not now plan on approving that project. (Suisan Tsushin, August 23, 1963.)

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EXPORTS OF FISH MEAL:

Chile's exports of fish meal the last week of July 1963, according to the Banco Central, amounted to 3,150 metric tons, which represents a return of US$587,000. Exports were mainly to France, United States, United Kingdom, Belgium, Philippines, and the Netherlands. Chilean trade sources expect that exports of fish meal and fish oil for all of 1963, will amount to US$11 million. (United States Embassy, Santiago, August 6, 1963.)

Denmark

FISHERY LANDINGS, JANUARY-JUNE 1963:

Fishery landings in Danish ports by Danish fishing craft during the first half of 1963 were 12 percent greater than in the same period of 1962, the record year for total landings (table 1). The severe winter caused declines in some catches, mostly in the ice-covered waters supporting the inshore fisheries, but North Sea yields were unaffected. Some of the inshore losses are being regained because of better catches after fishing again became possible.

Denmark (Contd.):

Table 1 - Fishery Landings in Danish Ports, First Half 1963

Species	January-June 1963 Quantity	Change from 1962	
	Metric Tons	Plus (%)	Minus (%)
By Danish Vessels:			
Flatfish	26,829	12	-
Cod	40,669	4	-
Herring	82,628	-	3
Brisling	2,654	-	26
Mackerel	3,743	25	-
Hornfish	1,055	-	45
Other salt-water fish 1/	207,649	25	-
Eels	690	22	-
Pond trout	3,717	5	-
Fresh-water fish	615	-	21
Mussels	5,349	-	17
Starfish	643	-	60
Shrimp, lobsters, etc.	3,037	2	-
Total by Danish vessels	379,278	12	-
By foreign vessels	65,555	49	-
Grand total	444,833	16	-
By Danish vessels in British, Swedish, and Dutch ports	1,452	-	38

1/Mainly industrial fish for fish meal and oil, ensilage, trout food, and fur-animal food.

Pond trout production, up 5 percent, did not decline, as had been forecast earlier.

Landings by foreign fishing vessels, mostly Swedish, increased by one-half because of their ice-blocked harbors.

Note: See Commercial Fisheries Review, August 1963 p. 86; July 1963 p. 72.

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FISHERIES EXPORTS, JANUARY-JUNE 1963:

Denmark exported record quantities of fishery products during the first half of 1963, especially fresh and frozen fish. The quantity increased 16 percent and the value was up 9 percent from the same period in 1962. Fresh and frozen herring, fillets, pond trout, eels, and semipreserved fish products exports showed the greatest gains. West Germany, the largest buyer, increased its imports while the United Kingdom, the next largest buyer, bought slightly less. Sweden moved into third place, with substantially greater purchases, displacing the United States whose imports dropped.

Table 2 - Value of Danish Fishery Products Exports by Groups and Major Countries, January-June 1963 and Change from 1962

Destination	Jan.-June 1963 Value		Percentage Change from 1962 Value	
	1,000 Kr.	US$ 1,000	Plus %	Minus %
By Groups:				
Common Market (EEC)	115,000	16,675	12	-
European Free Trade Association (EFTA)	102,000	14,790	3	-
East Bloc countries	20,000	2,900	100	-
Other countries	43,000	6,235	-	2
Total	280,000	40,600		
Major Importers by Country:				
West Germany	70,000	10,150	17	-
United Kingdom	44,000	6,380	-	6
Sweden	30,000	4,350	20	-
United States	20,000	2,900	-	14

Denmark's fishery products exports to the United States during the first half of 1963 declined 15 percent in quantity and 14 percent in value. Pond trout exports increased about one-fifth despite the severe winter and cod fillets gained slightly. However, exports of lobsters decreased by over one-half due to lower production, and canned sardines dropped 70 percent in value when the United States pack of Maine sardines returned to normal production.

Exports to secondary markets outside Europe may be expected to increase under a plan proposed by the Foreign Minister to set up new Embassies in Algeria and Kenya, and to establish 4 new commercial attache posts and 11 new consular secretaries, according to Danish newspaper reports.

Table 1 - Danish Fishery Products Exports to All Countries, January-June 1963 and Change from 1962

Product	January-June 1963			Percentage Change from 1962				January-December 1/1962		
	Qty.	Value		Qty.		Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US$ 1,000	Minus %	Plus %	Minus %	Plus %	Metric Tons	1,000 Kr.	US$ 1,000
Fresh fish	97,800	146,400	21,228	-	18	-	9	179,500	312,000	45,240
Frozen fish	23,400	68,900	9,990	-	31	-	18	39,600	132,500	19,213
Processed fish	8,000	34,600	5,017	12	-	-	5	19,500	73,500	10,657
Fish meal, fish solubles, etc.	30,600	28,700	4,162	-	9	3	-	63,900	66,400	9,628
Total	159,800	278,600	40,397	-	16	-	9	302,500	584,400	84,738
Fish oils 2/	3,500	2,500	363	-	288	-	316	15,200	10,600	1,537

1/Record year for quantity and value.
2/Comparative data are available only through April 1963.
Note: One Danish krone equals about US$0.145.

Denmark (Contd.):

Table 3 - Danish Fishery Products Exports to the United States by Species and Product, January-June 1963 and Change from 1962

Product	January-June 1963		Percentage Change from 1962		January-December 1962 1/	
	Quantity	Value	Quantity	Value	Quantity	Value
	Metric Tons	US$1,000	%	%	Metric Tons	US$1,000
Fresh and frozen:						
Pond trout	417	475	+ 17	+ 20	969	1,070
Other trout & salmon	-	-	2/	2/	58	76
Trout eggs	1	10	- 18	- 18	1	12
Flatfish	71	65	- 16	- 34	226	242
Fillets:						
Flatfish	45	27	+198	+166	23	17
Cod	3,802	1,724	+ 3	+ 6	7,903	3,553
Herring	-	-	3/	3/	5	2
Other	82	47	- 35	- 32	607	311
Lobster: Deep-water	44	136	- 55	- 53	308	952
Other	2	5/	- 76	- 69	14	18
Processed:						
Salted	33	9	- 26	- 11	122	35
Smoked	1	1	0	- 3	1	5
Canned:						
Brisling and herring	274	210	- 79	- 70	1,569	906
Shrimp	89	119	- 8	+ 10	209	249
Mussels	21	18	+121	+116	24	22
Other	21	12	+ 36	+ 15	31	22
Semipreserved:						
Caviar	7	12	+ 4	0	16	26
Other	1	5/	+200	+350	1	1
Fish solubles	100	14	4/	4/	100	12
Total	5,011	2,879	- 15	- 14	12,187	7,530

1/Record year for quantity and value.
2/Exports in 1962 amounted to 100 kgs. and 1,100 kroner.
3/Exports in 1962 amounted to 4,500 kgs. and 10,300 kroner.
4/There were no exports in 1962.
5/Less than US$1,000.
Source: Preliminary data from Ministry of Fisheries.

In 1962, Danish fisheries products were shipped to more than 110 different countries. Exports of some importance included about 50 categories of fresh and frozen products, 8 salted and dried, 4 smoked, 19 canned, 16 semipreserved, and 4 industrial (fish meal, oil, solubles and ensilage). With foreign markets favorably inclined toward Danish fishery products and with landings running slightly ahead of 1962, record exports for 1963 are probable. Markets for Danish fishery products in Europe are expanding to the extent that United States importers can expect more competition when buying Danish fish. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen. July 24, 1963.)

Note: See Commercial Fisheries Review, July 1963 p. 72; April 1963 p. 47; January 1963 p. 84.

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FISHERY EXPORTS TO RUMANIA:

Danish exports of fishery products to Rumania increased after a visit of the Danish Fishery Minister to Rumania about two years ago. The Rumanian Minister responsible for food imports was scheduled to arrive in Denmark on a visit to begin September 10. Rumanian imports of fishery products from Denmark in recent years are shown in the table.

Rumanian Imports of Fishery Products from Denmark, January-July 1963 and 1962

Product	Jan.-July 1963			Year 1962		
	Qty.	Value 1/		Qty.	Value 1/	
	Metric Tons	1,000 Kr.	US$ 1,000	Metric Tons	1,000 Kr.	US$ 1,000
Frozen herring	696	638	91.0	637	573	83.1
Frozen mackerel	293	253	36.7	-	-	-
Canned brisling and sardines	291	902	130.8	-	-	-
Total	1,280	1,793	258.5	637	573	83.1

1/One Danish krone equals US$0.145.

Increased trade in fishery products with Rumania is hindered by the lack of Rumanian products which Denmark can use. The available quota for Danish fishery products has not been fully utilized some years. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 28, 1963.)

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U.S.S.R. FISHERY MINISTER TO VISIT DENMARK:

The Soviet Fishery Minister was expected to visit Denmark and Danish fishery operations for 12 days beginning October 9, 1963. He was repaying the visit of the Danish Fishery Minister to the U.S.S.R. in June 1963. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 28, 1963.)

Ecuador

FISHING INDUSTRY TRENDS, JANUARY-JUNE 1963:

Fishery Products Export Value Up in First Half of 1963: Ecuador's fishery products exports in June 1963 were valued at US$0.5 million, the same as in the previous month but 66.6 percent higher than May 1963 exports.

In the first half of 1963, Ecuador exported fishery products valued at $1.9 million (quantity unavailable) as compared with a value of $1.7 million in the same period of 1962 when 5,405 metric tons of fish and fish products were exported.

Whaling: A Japanese firm was authorized in June to submit a proposal for a whale-processing plant, according to reports.

Fish Protein Concentrate: There is considerable exploratory activity by an English firm in the Guayaquil area concerning the production of fish meal for human consumption and the establishment of two joint ventures in the fish and fish-distribution industry. (United States Embassy, Quito, August 8, 1963.)

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JAPANESE STUDY ESTABLISHMENT OF WHALING ENTERPRISE IN ECUADOR:

A large Japanese fishing firm received a 10-year renewable authorization from Ecuador's Ministry of Development to establish a land-based installation in Ecuador for the hunting and processing of whales. The unpublished authorization (Acuerdo Ministerial 583, dated June 6, 1963), allows two Japanese flag vessels for one year to engage in the hunting of whales, requires employment of 75 percent Ecuadorean personnel in the land operations, imposes a special 1-percent tax the first year, and a 2-percent tax the third year in addition to normal taxes. Reportedly the Japanese firm is conducting a feasibility study of the project. (United States Embassy, August 24, 1963.)

Fiji Islands

CONSTRUCTION APPROVED OF JAPANESE COLD-STORAGE PLANT FOR TUNA IN FIJI ISLANDS:

A joint Japanese-British cold-storage plant is planned for Levuka, Fiji Islands (British). A Japanese fishing company reportedly was authorized on August 9, 1963, by the Japanese Overseas Investment Liaison Council (Government-industry advisory group) to invest its capital in the plant. Construction of the cold-storage plant, which is to be financed with a capital of 270 million yen (US$750,000), is scheduled to begin in September 1963. The plant (with a freezing capacity of 10 tons of fish a day, a cold-storage capacity of 2,000 tons, ice-producing capacity of 25 tons per day, and ice-holding capacity of 200 tons) is expected to be completed by the end of the year.

The cold-storage plant will be operated under a cooperative arrangement with the Japan South Pacific Ocean Fishery Cooperative, which will operate 30 fishing vessels (including 13 Cooperative-owned vessels) out of Levuka. The Cooperative's annual production target is 15,000 metric tons of fish, primarily tuna. Under present plans, the Japanese will purchase 9,000 tons of tuna from the Cooperative, which it will freeze at the Levuka cold-storage plant for export to the United States. (Suisan Keizai Shimbun, August 22; Nihon Suisan Shimbun, August 12, 1963.)

France

CERTIFICATE OF WHOLESOMENESS FOR IMPORTS OF CERTAIN SHELLFISH NO LONGER REQUIRED:

Shipments of sea molluscs and shellfish (shelled and frozen) when imported into France no longer require the submission of a "certificate of salubrity" but are subject to the formality of control and payment of the sanitary fees. This change in French import regulations was contained in a French decree published in the Journal Officiel of May 21, 1963. (United States Embassy, Paris, July 26, 1963.)

German Federal Republic

FISH FRESHNESS TESTER TO UNDERGO FURTHER TESTS:

A German machine which assesses the freshness of fish electronically is to undergo a series of comprehensive tests at Torry Research Station, Aberdeen, Scotland, the station director announced the latter part of July 1963.

The machine has been developed by an electronics firm of Hamburg, and preliminary tests of the prototype were made at Torry during the latter part of last year on limited numbers of cod, herring, whiting, and lemon sole. The result of those tests, when compared with results from other objective methods and with taste panel findings for the same fish, showed promise.

In a letter which appeared in Fish Trades Gazette on July 13, however, the Torry Research Station director qualified the statement that had been made by the firm with regard to the tests thus:

"We have not made numerous enough measurements of the freshness of fish using the fish tester to reach a statistically well based estimate of the degree of correlation of the data obtained by this method with those furnished by our taste panel, as well as by objective chemical tests, to warrant the statement made by the above mentioned firm that the fish tester has been successfully tested by Torry Research Station."

Since then the manufacturers have supplied one of the instruments to the Station and it will undergo a comprehensive series of further tests during the next few months.

The performance of the instrument on whole fish stored in ice will be compared with results obtained by taste panel and from chemical tests; the experiments will at first be confined to cod.

The fish tester consists of a measuring apparatus contained in a metal case and measuring forceps which are connected to the apparatus by a cable and special plug.

The measuring apparatus contains a fully transistorized circuit using 24 semiconductor elements (transistors, etc.) which produce the measuring current and evaluates it electronically in such a way that the measured value can be read directly and immediately on the scale of an instrument on the front panel of the metal case.

The indicator has a circular scale for each of five important kinds of fish (cod, haddock, coalfish, ocean perch or redfish, and herring), divided into "degrees of freshness." The "degrees of freshness" give the "freshness" of the measured fish in "reserve ice storage days," i.e. they indicate how many days the fish--being stored in ice immediately after the measurement--can be kept in usable condition.

The scale on top, calibrated linearly from 0 to 100, is to facilitate setting up calibration curves for types of fish other than those named, whose loss of freshness during storage in ice is found to be different and must first be determined empirically.

The metal case also contains two six-volt batteries which will last for about six months with daily use and can be exchanged by lifting off the front panel.

The measuring forceps carry a graphite electrode on each end, guided in a metal sleeve and fixed by a clamping screw so as to suit the thickness of the fish to be measured. For ease of use, a carrying case is supplied in which the apparatus can be carried so that the bearer has both hands free and can also read the indicated values on the scale of the instrument. A small pocket is attached to the case to house the forceps.

The tests carried out with the fish tester by the West German Federal Research Institute for Fisheries, Hamburg, proved that the indications of the degree of freshness were in accordance with the chemical and organoleptic statements, and that even when by means of certain alterations of storage conditions the proceedings of decay were delayed or accelerated and the kind of fish and, as to herring, also the different fat contents had no influence on the indicated degree of freshness.

The tests carried out with a fish tester by veterinary surgeons and market commissioners at the daily auctions at the fish markets at Cuxhaven, Hamburg, and Kiel have shown that the instrument indicates exactly the freshness of the fish quite subjectively according to quality.

The measuring principle on which the fish tester is based makes use of the fact that a.c. resistance of fish tissue contains capacitive components which are conditioned by the properties of the cellular skins. When, during storage of the fish, the fish albumen is removed or decomposed by enzymes of the fish and by bacterial activity (loss of freshness, advance of decay), the cellular skins consisting mainly of albumen are affected to the same extent and correspondingly lose the properties which contribute the capacitive components to the a.c. resistance of the tissue.

The same applies if the cellular skins of the tissue are more or less damaged by mechanical effects (knocks, blows, heavy pressure, etc.) or by ice crystal formation in the tissue on freezing.

Thus the tissue changes which occur with decreasing freshness (advancing decay) and mechanical damage are measured by electrical means through the reduction of the capacitive component of the a.c. resistance. Since with normal storage the mechanical effects are only of subsidiary importance, the tissue changes bear an empirically determined, direct and reproducible relationship to the freshness of the fish. (Fish Trades Gazette, August 3, 1963.)

Greece

REEFER FLEET INCREASES LANDINGS OF FROZEN FISH IN FIRST QUARTER 1963:

Landings in Greece of frozen fish by the Greek reefer fleet during the first quarter of 1963 were 36 percent over the same period of 1962. A total of 17 ocean-going fishing vessels with a total yearly capacity of 20,000 tons of frozen fish are currently in operation. This fleet is to be increased by 9 vessels by the end of 1963, and total capacity in 1964 will be 28,000 to 30,000 tons of frozen fish. (United States Embassy, Athens, August 7, 1963.)

Honduras

SHRIMP FISHERY EXPANDS:

The export shellfish industry of Honduras' north coast and Bay Islands continued to expand during the second quarter of 1963.

Honduras (Contd.)

Seven additional shrimp vessels (some of United States registry) moved into shrimp waters in the area around Caratasca. (United States Embassy, Tegucigalpa, August 5, 1963.)

Iceland

FISHERIES TRENDS, FIRST HALF 1963:

Iceland continued to be favored with good fish catches and high export prices during the first half of 1963. But the summer herring catch has been less than half of what it was at the end of July last summer, despite a longer season and additional vessels. It is probable that the value of exports will decline in succeeding months because of the decline in the summer herring catch. (Note: The period covered by this report does not include the poorer north and east coast summer herring season since the latter season extends into September and is not reflected in statistics covering the first half of 1963.)

Excellent fish catches during 1961, 1962, and the first half of 1963 have provided a rapid increase in personal income.

Exports: Iceland's increase in exports the first half of this year as compared with the first half of 1962 was attributable primarily to the large increase (30 percent) in herring product exports, which now is Iceland's highest value export, accounting for over 30 percent of total exports. Exports of frozen herring during the first five months of 1963 amounted to 123.5 million kronur (US$2.8 million), an increase of more than 100 percent over the same period in 1962. Sixty percent of the frozen herring exports went to the Soviet Bloc (70.9 percent in 1962). The value of herring meal exports amounted to 187.1 million kronur ($4.4 million) the first five months, an increase of 60 percent over the same period in 1962. Exports of salted herring, half of which went to the Soviet Bloc, also increased. The value of herring oil exports dropped, however, partially due to a drop in the price received for herring oil during the first five months of 1963 as compared to 1962.

Frozen fish fillets, which account for about 25 percent of Iceland's total exports (28 percent of which go to the Soviet Bloc), amounted to 477.8 million kronur ($11.1 million) for the first five months, a slight decrease compared to last year. Likewise, exports of salted fish (other than herring), which go primarily to Spain and Italy, declined to 128.6 million kronur ($3.0 million), a drop of 21.2 percent for the first five months of 1963 as compared to that period in 1962. Exports of stockfish, sold primarily to Nigeria, dropped to 67.7 million kronur ($1.6 million), a decrease of 37.0 percent during the same period. On the other hand, exports of groundfish on ice (sold mostly to Great Britain) jumped to 85.6 million kronur ($2.0 million) for the five-months period, an increase of 46.7 percent.

Reports at the end of July indicate a relatively poor summer herring season in contrast to the exceptional catches of the last two summers. (It should be noted that new electronic equipment for locating the herring was first used in 1961 and 1962 and accounts for the substantial increase in the herring catch those years. It would seem, therefore, that the 1931 and 1962 standard is a fair comparison to indicate a poor season in 1963.) By the end of July, the North and East Coast herring catch was less than 50 percent of what it was at that time last year, despite the fact that the herring season started a month earlier this year, and there is a larger number of vessels fishing. Because of the poorer fishing season a greater proportion of the catch is being salted or frozen, thus the value of the catch may be somewhat higher than indicated merely by a comparison of the quantities caught in 1963 and 1962. Nevertheless, the export value of herring products (salted, frozen, fish meal and oil, etc.) will be probably less than last year. In order to fulfill export contracts with eight countries for 394,000 barrels of salted herring, about 430,000 barrels (which includes domestic consumption) had to be salted this summer. (By August 10, 1963, the quantity of herring salted was more than on the same date of the peak year 1962. The quantity sent for reduction was substantially less.)

Although the total value of exports changed by only 5 percent the first six months of 1963 as compared to that period in 1962, unsold export stocks were considerably higher at the end of June than a year ago. Major shifts in the distribution of exports have occurred. Whereas exports to the United States (Icelands's largest market) and West Germany (fourth largest) increased 44.2 percent and 11.2 percent respectively, exports to the Soviet Union (Iceland's second largest market) and Great Britain (third largest) decreased 15.5 percent and 13.0 percent, respectively. The United States' share of Iceland's frozen fish fillet exports increased from 42 percent for the first half of 1962 to 63 percent for the first five months of 1963. Inasmuch as frozen fish fillets now account for 90 percent of Iceland's exports to the United States, the increase of this export was the main contributor to the large increase of total exports to the United States. Although the share of Iceland's frozen fish fillets exported to the Soviet Bloc dropped somewhat in the first half of 1963, a contract signed in April to provide the U.S.S.R. with 15,000 metric tons of frozen groundfish before the end of 1963 indicates that exports of that product to the U.S.S.R. will increase during the second half of 1963.

Bilateral Trade: Although the Government continues a policy of barter trade with the Soviet Bloc in order to insure a market for a substantial part of Iceland's fish exports, there continues to be a trend of decreasing trade with that area. In view of the increase in Iceland's herring exports, a large part of which are sold to the Bloc countries, there appears little likelihood of further decrease in trade with the Bloc unless additional markets for herring products can be developed in the Western countries. On the other hand, the Bloc, because of its own greatly increased herring operations, may soon become self-sufficient in herring products, leaving Iceland without its chief market.

Trade Agreements, Protocols and Contracts Concluded with the Bloc in 1963: A trade agreement between Iceland and Hungary was concluded in February, covering one year and providing for sales to Hungary of frozen fish, herring fish meal, fish oils, wool, sheepskins and hides and for sales to Iceland of iron and steel, sugar, textiles, household utensils, and other goods.

A trade protocol between Iceland and Poland covering one year starting October 1, 1963, was concluded July 12. The protocol provides for sales to Poland of salted herring, frozen herring, fish meal and oil, salted sheepskins and for sales to Iceland of coal, textiles, chemicals, sugar, lumber, iron and steel products, machinery, tools, household equipment, potatoes and other food products. Negotiations are presently under way for the annual trade protocol with Czechoslovakia.

The most important sales contracts concluded with the Bloc during the reporting period were: (1) a contract signed in April between the Freezing Plants Corporation and the Federation of Icelandic Cooperatives on the one hand and a Soviet trade mission on the other, to supply the USSR 15,000 tons of frozen fish fillets (This is the minimum trade level specified in the current protocol.), (2) a contract signed in February between the Icelandic Federation of Cooperatives and a Soviet trade mission to supply the USSR with 12,000 metric tons of frozen herring, and (3) a contract concluded in July between the Icelandic State Herring Committee and a Soviet trade mission to supply the USSR with 120,000 barrels of salted herring. The above contracts were in accordance with the three-year trade protocol between Iceland and the USSR concluded in December 1962. (United States Embassy, Reykjavik, August 23, 1963.)

Iran

CAVIAR PRODUCTION BY TYPES OF STURGEON, FISCAL YEAR 1962/63:

Iran is a principal producer of caviar in the world. In the fiscal year starting August 1962, a total of 210 metric tons of caviar was produced as the season neared to a close. This was an increase of 18 percent from the previous fiscal year's production, and 33.8 percent above the 1957/58 season's production. Iran's yearly average caviar production was 170 tons for each year since fiscal year 1957/58.

Table 1 - Iran's Caviar Production by Types of Sturgeon, Fiscal Year 1962/63 and Comparisons

Type of Sturgeon	FY1962/63	FY1961/62	FY1960/61	FY1959/60	FY1958/59	FY1957/58
	(Metric Tons)					
Beluga	40	39	39	35	27	24
Ossetra	70	54	52	53	43	49
Sevruga	100	85	75	75	75	79
Girovaia--Ikra	-	-	-	-	-	5
Total	210	178	166	163	145	157

Sturgeon is the most important species caught in Iran's Caspian Sea fishery, followed by white salmon, white fish, carp, bream, pike, catfish, and herring. The production season for caviar runs from August to August of the following year because the fishing season for sturgeon begins in that month.

Table 2 - Sturgeon Meat Processed for Sale by Iran, Fiscal Year 1962/63 and Comparisons

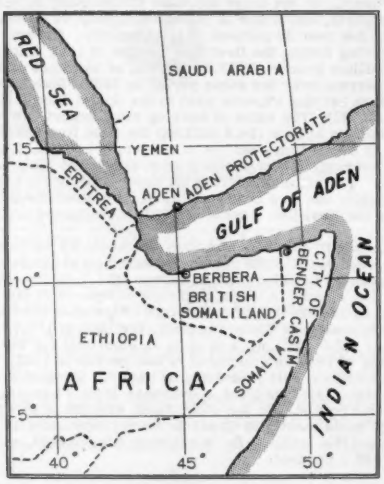
FY1962/63	FY1961/62	FY1960/61	FY1959/60	FY1958/59
(Metric Tons)				
1,700	1,439	1,491	1,275	1,107

The amount of sturgeon meat processed for sale has increased steadily from 1,107 tons in fiscal year 1958/59 to 1,700 tons in 1962/63 (table 2), according to the United States Embassy, Tehran, July 17, 1963.

Israel

OCEANOGRAPHIC RESEARCH IN THE RED SEA:

Since the opening to Israeli shipping of the Straits of Tiran which join the Gulf of Aqaba to the Red Sea, major efforts have been devoted to developing the city of Eilat and to promoting Israeli shipping to the East via that port. A significant effort has also been made to establish Israeli oceanographic research in the Red Sea. A small expedition of marine biologists under the direction of a Professor of the Hebrew University spent several weeks in 1956 collecting specimens from the Straits of Tiran around the south end of Sinai as far west as El Tur in the Gulf of Suez. Later, attention was turned to the south end of the Red Sea. By agreement with the Government of Ethiopia, the port of Massawa was made available to Israeli expeditions studying marine life along the coast of Eritrea. Considerable resources of edible fish were found, and an Israeli trawler fleet employing both Israeli and Ethiopian fishermen is reported to have been operating successfully for the last six years in the vicinity of Massawa.



The first of what is expected to be a series of major international expeditions to the Red Sea under Israeli leadership was staged in April and May 1962. Operating again from the port of Massawa with logistic support furnished by the Ethiopian Navy, the 1962 expedition included 15 scientists from four nations (Israel, the United States, the Netherlands, and Ethiopia), and collected a rich

Israel (Contd.):

harvest of specimens of fish, marine plants and birds. The analysis of this collection is still under way.

A larger and more ambitious expedition is being planned for the fall of 1964. It is hoped that the number of scientists can be expanded to about 30, and that the United States and other nations will again be well represented. Negotiations are under way with the Government of Ethiopia to renew the cooperative arrangement with the Ethiopian Navy which existed at the time of the 1962 expedition.

The tentative budget for expenses (exclusive of salaries) in the 1964 expedition is IŁ150,000 (US$50,000). Of this, IŁ45,000 ($15,000) has already been pledged by the Israeli Academy of Arts and Sciences, and additional sums are being sought from the Ministries of Agriculture and of Development. A proposal has also been submitted by a Professor of the Tel Aviv University to the Office of Naval Research for an extension of an existing contract to permit payment of some of the expedition expenses.

The expedition's organizers are receiving numerous proposals from scientists in Israel and abroad for participation in the 1964 expedition. These are now being evaluated and coordinated with plans for the much larger-scale Indian Ocean Expedition. A summary outline of the objectives and techniques of the 1964 Red Sea expedition will be published later this year.

Very small and inadequate facilities for marine biological research in Eilat have been constructed and used by the professors of Tel Aviv University and the Professor of the Hebrew University. About a year ago, Hebrew University officials drafted a plan for a much more substantial laboratory facility, costing $200,000 to $250,000 and including space for 4 or 5 laboratories and for auxiliary services. This expanded Marine Station would provide an excellent home base for the 1964 expedition, and would also be used on a continuing basis by Israeli and foreign scientists working in the Gulf of Aqaba. Efforts to raise the money needed for this installation include a proposal now being evaluated by the National Science Foundation. (United States Embassy, Tel Aviv, August 20, 1963.)

Japan

FROZEN TUNA EXPORT MARKET IMPROVES:

The Japanese frozen tuna export market was reported in mid-August 1963, to be showing signs of recovery. Latest available price information indicates that frozen round albacore are selling at $370 a short ton c.i.f. and frozen gilled-and-gutted yellowfin at price of $335 a short ton c.i.f. Reportedly, those are prevailing market prices for shipments to the United States directly from Japan proper and for Atlantic Ocean transshipments.

Japanese press reports show that in late June and early July, Japanese exporters concluded agreements to deliver (in late July and in August), approximately 3,000 short tons of frozen round albacore at f.o.b. prices of $270-280 a short ton. However, due to the sharp recovery of the export tuna market, the Japanese exporting firms have not been meeting their commitments since they would stand to lose $60-80 a short ton on their deliveries. One large exporter is said to have already cancelled its agreement to deliver 800 short tons of frozen albacore to a large American tuna packer. Some firms are said to be seeking adjustments so that the original agreements entered into when prices were low would more closely reflect actual changes in market conditions. (Suisan Tsushin, August 15 and 21, 1963.)

* * * * *

JAPANESE MINISTER PLANS TO DISCUSS UNITED STATES TARIFF ON CANNED TUNA:

The Japanese Minister of Forestry and Agriculture, who was scheduled to attend the Japan-Canada Ministerial Economic Conference in Canada on September 25-26, 1963, planned to visit the United States after that conference. Reportedly, the Minister planned to discuss with United States officials the matter of the United States tariff on canned tuna in brine and the present method of assessing duties on that product.

Japanese canned tuna canners are concerned over the low United States pack of canned tuna in 1963 because this will result in a smaller quantity of foreign-produced canned tuna in brine that can be admitted in 1964 into the United States at the lower duty rate of 12½ percent ad valorem. Under the present United States tariff structure, an ad

Japan (Contd.):

valorem duty of 12½ percent is assessed on canned tuna in brine imports amounting to 20 percent of the total United States domestic production for the previous calendar year. Imports exceeding that amount are dutiable at 25 percent ad valorem. Japanese packers are said to be seeking arrangements through their Government whereby some adjustment can be worked out for 1964 imports only. (Suisan Keizai Shimbun, August 23, 1963.)

* * * * *

LARGE INCREASE EXPECTED IN OVERSEAS TUNA OPERATIONS:

The Japanese Fisheries Agency, which is planning on strengthening the management of Japan's distant-water fisheries, is reported to be making a study of those fisheries on the basis that there will be a large increase in the numbers of Japanese tuna vessels operating out of overseas bases. Figures projected

Number of Japanese Tuna Vessels Expected to be Operating Out of Overseas Bases in Fiscal Year 1964

Area	FY 1964	FY 1962
	. . . (No. Vessels) . . .	
Pacific Ocean:		
Samoa	100	70
Espiritu Santo, New Hebrides Is.	20	18
Noumea, New Caledonia	35	-
Levuka, Fiji Is.	30	-
Indian Ocean:		
Singapore	0	3
Penang, Malaya	50	1
Ceylon	3	3
Atlantic Ocean	120	112

by the Fisheries Agency for Fiscal Year 1964 (April 1964-March 1965), are shown in the table. For comparative purposes, the disposition of the Japanese tuna fleet in FY 1962 (April 1962-March 1963), is shown. (Shin Suisan Shimbun Sokuho, August 17, 1963.)

* * * * *

NEW PORTABLE-VESSEL-CARRYING TUNA MOTHERSHIP COMPLETED:

The 2,800-ton Class 2 portable-vessel-carrying tuna mothership Kaikei Maru No. 58 was delivered to her Japanese owners in August 1963. The vessel is the first of its kind to be built from keel up as a Class 2 tuna mothership. As a Class 2 tuna mothership (vessel over 2,000 tons gross), she cannot engage directly in fishing, but will deck-carry six 20-ton portable vessels (each powered with a 90-horsepower engine and carrying a crew of 12) to do the actual fishing. Specifications of the tuna mothership: length 321.4 feet, beam 48.5 feet, gross tonnage 2,801 tons, main engine 2,400 hp., cold-storage capacity 2,300 metric tons, crew 144, and 6 portable fishing boats.

The vessel was scheduled to depart for the Atlantic Ocean on August 28, and will operate out of Las Palmas, Canary Islands, for a two-year period. (Suisan Keizai Shimbun, August 22, 1963.)

* * * * *

UNIVERSITY TO STUDY RELATION BETWEEN SEA BIRDS AND TUNA MIGRATIONS:

The Tokai University Fisheries Research Laboratory (Shizuoka, Japan) is conducting a study to determine the relationship of the migratory habits of sea birds to tuna migrations off the coast of Japan. The Laboratory plans to undertake this project by conducting bird-tagging experiments on the island of Hachijo located south of Tokyo. (Suisan Keizai Shimbun, August 21, 1963.)

* * * * *

SALMON MOTHERSHIP FLEET ATTAINS NORTH PACIFIC QUOTA FOR 1963:

The 1963 North Pacific salmon season, which began officially on May 15, 1963, ended on August 1, with 11 Japanese mothership fleets having taken a total of 46,287 metric tons[1/] of salmon of all species. This was the allowable catch quota set for Area A of convention waters by the Northwest Pacific Fisheries Commission (U.S.S.R.-Japan) for Japanese mothership operations.

The over-all salmon quota for Area A in 1963 was set at 57,000 metric tons (2,000 tons more than in 1962) on April 4, 1963, when the Commission reached an agreement on Japan's salmon quota for that year. The Commission sets the annual Soviet and Japanese catch quota for salmon and king crab in the Northwest Pacific Ocean.

The number of vessels (11 salmon motherships and 369 catcher vessels) permitted to operate in the North Pacific salmon fishery in 1963 was the same as in 1962. (United States Embassy, Tokyo, August 9, 1963.)

1/Editor's Note: This is believed to be the share of the 57,000-ton quota assigned to the mothership fleet.

Note: See Commercial Fisheries Review, June 1963 p. 58

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Japan (Contd.):

BOTTOMFISH FISHING FLEETS IN BERING SEA REPORT POOR FISHING:

The 19 Japanese bottomfish fishing fleets licensed in 1963, to operate in the Bering Sea report poor fishing and are expected to end their operations in the red. As of early July, they were reported to have met only 51 percent (137,500 metric tons) of their combined total catch target of 267,880 metric tons. Their combined total catches as of early July are estimated as follows: halibut 9,000 metric tons; sablefish 14,000 tons; cod 7,500 tons; flatfish 44,000 tons; rockfish 6,000 tons; Alaska pollock 26,000 tons; herring 10,000 tons; and shrimp 21,000 metric tons. Except for herring and shrimp, fishing is reported to be poor for the other species.

On the other hand, the four trawlers licensed to operate on an experimental basis in the summer of 1963 in the eastern North Pacific Ocean south of the Aleutian Islands and the Alaska Peninsula reported good fishing into July. Over 60 percent of their catches were reported made up of ocean perch, which are highly prized, and shrimp (Pandalus species) taken off the British Columbia coast. The shrimp reportedly has an ex-vessel market value of 600,000 yen per metric ton (US$0.76 a pound) in Japan.

Reportedly, the trial fishing conducted by the four Japanese trawlers in the eastern North Pacific Ocean clearly indicated that full-scale commercial fishing operations are feasible. (Suisan Keizai Shimbun, July 30, 1963.)

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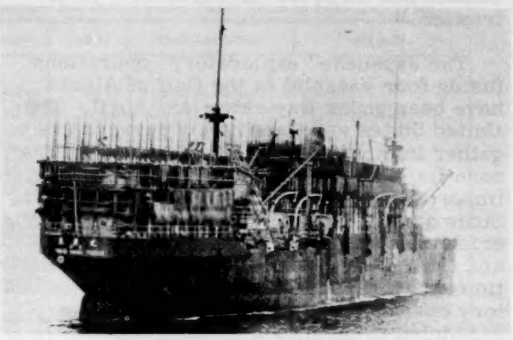
KING CRAB FLEETS IN BRISTOL BAY REPORT POOR FISHING:

The Japanese king crab fleets operating in Bristol Bay report poor fishing. As of July 23, 1963, the Tokei Maru (5,385 gross tons) was reported to have packed 66,500 cases (target--120,000 cases) and the Dainichi Maru (5,858 gross tons) 76,300 cases (target--115,000 cases). Catch-per-unit of effort of the Tokei Maru was 8.9 crabs per tan (shackle) and the Dainichi Maru 9.9 crabs per tan. Their net-soaking time is said to have increased and the crabs were reported to be running smaller in size this year. As a result of poor fishing, the two Japanese king crab fleets were expected to extend their operations a month longer than anticipated.



Tokei Maru, Japanese crab factoryship.

The decline in king crab catch is attributed in part to greater fishing intensity. In addition to the two Japanese crab fleets, three Russian king crab fleets were reported to have operated in the Bristol Bay area. The Russian crab fleets are said to have also operated in the Gulf of Alaska waters. (Suisan Keizai Shimbun, July 25, 1963, and other sources.)

* * * * *

SHRIMP FISHING IN GULF OF ALASKA:

Japanese trawlers exploring the fisheries resources of the Gulf of Alaska are making excellent catches of shrimp near Kodiak Island, according to the Alaska Regional Director of the U. S. Bureau of Commercial Fisheries. Catches of about ten tons of shrimp per day are being made by two Japanese trawlers operating 20 to 50 miles off the southwest tip of Kodiak Island. The catches reportedly consist of large pink shrimp with good quantities of the larger sidestripe variety.

Observations in late August and early September by a U. S. Bureau of Commercial Fisheries exploratory vessel have confirmed reports that considerable numbers of king crabs and lesser amounts of halibut are also caught in the trawl nets taking shrimp. Provisions of the license issued each vessel by the Japanese Fisheries Agency require all king crab, halibut, and salmon taken to be returned to the sea. A U. S. Bureau of Commercial Fisheries scientist is making observations of catches and handling techniques aboard one of the two Japanese trawlers.

Japan (Contd.):

Canada has an observer aboard the other trawler.

The Japanese "exploratory" operations (using four vessels) in the Gulf of Alaska have been under way since last April. The United States and Canadian observers are to gather information on the effect of the Japanese fishing upon halibut stocks, of prime importance to the United States and Canada. Since operations began in early spring, fisheries specialists of both the United States and Canada have provided continual observation aboard the Japanese ships. The exploratory operations in the Gulf of Alaska were scheduled to terminate October 31.

* * * * *

PLANNING COMMITTEE ESTABLISHED FOR TRIPARTITE NORTH PACIFIC FISHERIES CONVENTION:

The Japan Fishery Association on July 11, 1963, established a committee named the "Planning Committee for the Tripartite Fisheries Convention" with terms of reference to (1) study the text of the Japanese draft treaty with reference to its effect on Japan's fishery, (2) study the effect of abrogation of the present treaty on foreign trade in exports of fish and fish products to the United States, and (3) study the effects of the United States and Canadian proposals for revision of the Tripartite (Japan, Canada, and United States) Treaty on the Japanese fishery.

The Committee held its first organizational meeting on July 15, and was scheduled to conduct meetings at weekly or ten-day intervals. Experts from the various fields of the fishing industry were to be invited to express their views on the topics under study. (Fishery Attache, United States Embassy, Tokyo, August 6, 1963.)

* * * * *

ATLANTIC TRAWLERS MAY FISH HAKE:

The large Japanese fishing companies operating stern trawlers in the Atlantic Ocean are reported showing considerable interest in fishing hake, primarily for export to Europe and Africa. Those vessels have been concentrating on fishing squid, octopus, and sea bream. One firm is already reported to have contracted to deliver 3,000 metric tons of hake to Spain in 1963.

A trial shipment of frozen hake shipped to Japan reportedly sold for the following prices: round 75,000 yen a metric ton (US$0.095 a lb.), dressed 100,000 yen a ton ($0.126 a lb.), fillet 150,000 yen a ton ($0.189 a lb.).

Prices paid for the trial shipment are said to have even surprised the Japanese firms which introduced the species to Japan. Reportedly, since hake belong to the cod family and since cod are not highly prized in Japan, there was some concern regarding consumer acceptance. However, the sales results were gratifying. Opinion is that, with some promotion, a market for hake can be developed in Japan also. (Minato Shimbun, August 15 and July 26, 1963.)

* * * * *

JAPAN-COMMUNIST CHINA FISHERIES AGREEMENT:

There appeared a press report in August 1963 that a private Japanese fisheries mission is expected to go to Communist China in October to negotiate a new Japan-Communist China fisheries agreement to replace the expired 1955 agreement. That agreement, among other things, guaranteed the safe operation of Japanese fishing boats in the East China Sea, e.g. taking refuge in Communist Chinese ports in cases of emergency, the supply of water and food, etc.

At the end of August 1963 there was in Japan an eight-man fisheries delegation headed by the Vice-Chairman of the Chinese Fisheries Association. The group arrived August 14 and was scheduled to stay about three weeks. The visit was in return for the visit to Communist China last January of a Japanese group headed by the Chairman of the Board of a large Japanese fishing company. (United States Embassy, Tokyo, August 26, 1963.)

* * * * *

EXPORTS OF FISHERY PRODUCTS TO THE UNITED STATES, 1962, AND APPLICABLE UNITED STATES IMPORT DUTIES:

Japanese exports of fishery products to the United States in 1962 were valued at US$104.9 million. The general declines since 1934 in United States tariff rates on fishery products imported into the United States from Japan are shown in the table on the following page.

Japan (Contd.):

Japanese Exports of Fishery Products to the United States, 1962
(By United States Import Commodity Descriptions, with Comparative United States Tariff Rates in 1963 and 1934)

Item	Unit	Quantity	Value [1]	Tariff July 1, 1934 [2]	1963 tariff
EDIBLE PRODUCTS					
Frog legs, fresh, chilled, or frozen		1,322,863	$1,354,647	10 percent ad valorem	5 percent.
Frog legs, prepared or preserved		5,738	7,638	20 percent ad valorem	12 percent.
Fresh water trout, not elsewhere included, fresh and frozen		1,845,919	747,447	1 cent per pound	0.5 cents per pound.
Fresh water n.e.s. and blue pike, fresh or frozen		300	131	do	Do.
Eels, fresh or frozen		800	812	do	Do.
Salmon, fresh or frozen		165,753	113,860	2 cents per pound	Do.
Cod, haddock, hake, pollock, and cusk, fresh or frozen		318,300	51,385	1 cent per pound	Do.
Halibut, fresh or frozen [3]		394,164	107,260	2 cents per pound	Do.
Mackerel, frozen		447,695	73,300	do	0.75 cents per pound.
Sturgeon, fresh or frozen		130,626	47,399	1 cent per pound	0.5 cents per pound.
Swordfish, frozen		59,316	21,729	2 cents per pound	0.75 cents per pound.
Shad, fresh or frozen		200	290	1 cent per pound	0.5 cents per pound.
Fish, n.e.s., fresh or frozen		1,761,804	338,476	do	1 cent per pound.
Smelts, fresh or frozen		390,896	74,348	Free	Free.
Albacore, whole, fresh or frozen, not cooked		52,074,117	9,346,616	do	Do.
Albacore, n.e.s., fresh or frozen, not cooked		2,464,777	412,264	do	Do.
Yellowfin, etc., whole, fresh or frozen, not cooked		4,057,636	622,757	do	Do.
Yellowfin, etc., gilled and gutted, fresh or frozen, not cooked		66,865,020	11,392,296	do	Do.
Yellowfin, etc., filleted, fresh or frozen, not cooked		10,732,820	1,897,632	do	Do.
Yellowfin, etc., gilled and gutted, heads, tails removed		10,772,880	1,658,272	do	Do.
Yellowfin, etc., n.e.s., fresh or frozen, not cooked		963,656	101,857	do	Do.
Skipjack tuna, fresh or frozen, not cooked		1,291,618	141,455	do	Do.
Tuna, not elsewhere specified, fresh or frozen, not cooked		1,606,740	211,371	do	Do.
Cod, filleted, fresh or frozen		21,630	4,047	2½ cents per pound	1.875 cents per pound and 2¼ cents per pound. [3]
Swordfish, filleted, fresh or frozen		18,425,981	6,232,416	do	1.5 cents per pound. [3]
Halibut and salmon, filleted, fresh or frozen		4,235,213	1,722,799	do	Do.
Yellow pike filleted, fresh or frozen		25,000	4,[illegible]3	do	Do.
Fresh wate fish except yellow pike, filleted, fresh or frozen		10,000	3,230	do	Do.
Flounders, filleted, fresh, or frozen		23,148	10,338	do	Do.
Wolffish, filleted, fresh, or frozen		5,700	2,787	do	1 cent per pound.
Fish, filleted, boned, etc., fresh or frozen		3,903,804	1,161,389	do	1.5 cents per pound.
Cod, haddock, etc., dried and unsalted		2,045	750	do	0.2 cent per pound.
Shark fins, dried and unsalted		56,611	64,794	1¼ cents per pound	0.52 cent per pound.
Fish, n.e.s., dried and unsalted		115,796	82,970	do	0.3125 cents per pound.
Sardines in oil, not skinned or boned—over 18, not over 23 cents per pound.		497	108	30 percent	20 percent.
Sardines in oil, not skinned or boned—over 23, not over 30 cents per pound.		5,934	2,220	do	15 percent.
Sardines in oil, not skinned or boned—over 30 cents per pound, smoked.		4,960	2,188	do	12.5 percent.
Sardines in oil, not skinned or boned—over 30 cents per pound		3,774	900	do	15 percent.
Sardines in oil, skinned or boned—over 30 cents per pound		2,100	1,300	do	24 percent.
Anchovies in oil, valued over 9 cents per pound		397	163	do	12 percent.
White meat tunafish in oil, canned		206,118	91,113	45 percent	35 percent.
Other tunafish in oil, canned		32,053	13,335	do	Do.
Bonito and yellowtail in oil, valued over 9 cents per pound		36,731	12,522	30 percent	15 percent.
Smoked pollock in oil, valued at over 9 cents per pound		12,039	6,653	do	Do.
Fish in oil, n.e.s., over 9 cents per pound		390,223	181,415	do	25.5 percent.
Salmon, not in oil, in airtight containers		4,422,335	2,237,655	25 percent	15 percent ad valorem.
Canned albacore in brine		26,081,906	12,053,459	do	12.5 percent. [3]
Canned tuna in brine, n.e.s.		21,032,909	7,912,761	do	Do. [3]
Fish cakes, balls, and pudding, not in oil, airtight		358,516	125,955	do	3 percent.
Herring, smoked or kippered or in tomato sauce		998,010	180,483	do	6.25 percent. [3]
Bonito in brine, in airtight containers		63,499	24,119	do	12.5 percent. [3]
Fish, n.e.s., in airtight containers		158,708	113,164	do	Do. [3]
Salmon, pickled or salted		3,185	3,014	25 percent ad valorem	8.5 percent.
Cod, haddock, etc., pickled, salted, skinned or boned		7,825	1,994	2 cents per pound	0.75 cent per pound.
Herring, pickled or salted, in containers, not over 10 pounds, net		30	$118	1 cent per pound	0.14 cent per pound. [3]
Herring, pickled or salted, in containers, over 10 pounds net		250	213	do	0.1 cent per pound. [3]
Mackerel, pickled or salted, bulk or containers, over 15 pounds		6,500	989	do	0.2 cent per pound.
Fish, pickled, salted, n.s.p.f., bulk or containers, over 15 pounds.		118,759	54,547	1¼ cents per pound	1¼ cents per pound.
Fish, pickled, salted, n.s.p.f., in containers, not over 15 pounds		1,500	801	25 percent ad valorem	25 percent.
Salmon, smoked or kippered, n.e.s.		122	420	do	10 percent.
Cod, etc., filleted, smoked or kippered		288	110	3 cents per pound	0.5 cent per pound.
Fish, smoked or kippered, n.s.p.f.		600	200	25 percent ad valorem	6.25 percent.
Fish, n.e.s., in containers, not over 15 pounds		26,596	23,985	do	12.5 percent. [3]
Albacore, loins, and disks, prepared, n.e.s., bulk or containers, not over 15 pounds.		1,630,638	609,423	1¼ cents per pound	1 cent per pound.
Tunas, loins and disks, n.e.s., prepared, bulk or containers, not over 15 pounds.		8,566,867	3,117,844	1¼ cents per pound	1 cent per pound.
Frozen blocks or slabs, uncooked fish bits, etc.		34,800	5,740	do	Do.
Other prepared or preserved fish		277,862	152,272	do	Do.
Fish paste and fish sauce		22,223	14,510	30 percent	8 percent.
Fish roe, n.s.p.f., not boiled		25,517	56,089	30 cents per pound	4 cents per pound.
Fish roe, n.e.s., for food, boiled, in airtight containers		2,333	4,108	30 percent	5.5 percent.
Crabmeat, etc., fresh or frozen		206,300	188,634	15 percent	15 percent.
Crabmeat, etc., prepared in airtight containers		3,441,854	4,635,347	do	22.5 percent.
Oysters, etc., in airtight containers		2,777,969	916,272	8 cents per pound	6 cents per pound.
Oysters, smoked, in airtight containers		1,402,155	660,265	do	4.5 cents per pound.
Other oysters, etc., in airtight containers		3,106,862	825,326	do	6 cents per pound.
Razor clams, canned		1,428	631	23 percent	7.5 percent.
Clams, n.e.s.		1,354,180	809,241	Free	Free.
Clam chowder and clam juice and combinations		5,441	5,009	35 percent [4]	17.5 percent. [4]
Roch lobster tails		299,647	338,160	Free	Free.
Other fresh or frozen lobsters		47,144	45,999	do	Do.
Lobsters, canned		914	1,562	do	Do.
Turtles		20	330	do	Do.
Clams, quahogs, not in airtight containers		358,083	78,136	do	Do.
Shrimps and prawns		1,468,230	873,366	do	Do.
Headless shrimp, fresh or frozen		91,369	63,938	do	Do.
Peeled and deveined shrimp, frozen		1,281,491	848,229	do	Do.
Shrimp and prawns, n.e.s.		1,080,953	951,313	do	Do.
Scallops, fresh, frozen, and prepared		82,576	96,358	do	Do.
Oysters fresh or frozen, not in airtight containers		94,228	53,176	do	Do.
Oysters, n.e.s., not in airtight containers		1,542,801	162,477	do	Do.
Abalone		105,313	171,897	do	Do.
Shellfish, n.s.p.f.		3,009,866	695,434	do	Do.
Shellfish pastes and sauces, n.s.p.f.		638	528	do	Do.
Total, edible		270,461,675	77,512,899		

(Table continued on next page.)

Japan (Contd.):

Japanese Exports of Fishery Products to the United States, 1962
(By United States Import Commodity Descriptions, with Comparative United States Tariff Rates in 1963 and 1934) (Contd.)

Item	Unit	Quantity	Value 1	Tariff July 1, 1934 2	1963 tariff
NONEDIBLE PRODUCTS					
Whale oil, sperm, refined or processed	Gallon	5,638	4,605	1.87 cents per pound	0.47 cent per pound.
Cod liver oil	do	385,555	433,049	Free	Free.
Kelp	Pound	131,670	85,356	do	Do.
Coral, marine, uncut and unmanufactured	do	2,385	19,280	do	Do.
Fish scrap except fertilizer	Short ton	15	4,800	do	Do.
Whale bone, unmanufactured			318	do	5 percent.
Goldfish and other aquarian fish, n.e.s.			17,003	do	Free.
Fish, inedible, n.e.s.			2,843,549	do	Do.
Shells, mother of pearl and trocus, unmanufactured	Pound	299,406	164,184	do	Do.
Shells, n.s.p.f., unmanufactured	do	181,618	20,419	do	Do.
Fish solubles	Short ton	338	11,578	do	Do.
Halibut liver oil, advanced	Pound	3,947	5,590	10 percent plus 3 cents per pound.	5 percent.
Fish oils and fish liver oils, n.e.s., advanced	do	232,897	914,195	do	Do.
Agar-Agar	do	140,820	244,944	25 percent	15 percent.
Spermaceti wax	do	29,880	4,747	3.5 cents per pound	2.5 cents per pound.
Pearl essence	do	36,000	241,072	25 percent	9 percent.
Buttons, fresh water, pearl or shell	Gross lines	1,536,722		1.75 cents plus 25 percent	1.75 cents plus 25 percent.
Buttons, ocean pearl shell	do	3,434,053		do	Do.
Natural pearls and parts			365,619	10 percent	3 percent.
Cultured pearls and parts			17,934,156	do	5 percent.
Reptile and sharkskin, leather, n.e.s.			17,781	25 percent	10 percent.
Luggage, leather, fitted with travel sets, etc.			59,960	35 percent	Do.
Luggage, reptile, not fitted			7,085	do	17.5 percent.
Purses, billfolds, etc., leather, reptile			1,252	do	14 percent.
Leather manufactures, n.e.s., reptile			7,154	do	Do.
Shells, etc., cut, engraved, ornamented or otherwise manufactured			25,427	do	17.5 percent.
Manufactures of shell and mother-of-pearl			173,805	do	Do.
Moss, sea grass, etc., dyed, manufactured, n.s.p.f.			228,776	10 percent	22 percent.
Whale oil, sperm, crude	Gallon	5,206,777	3,563,470	0.67 cent per pound	0.085 cent per pound.
Total, nonedible			27,397,771		
Grand total			104,910,676		

1/The dollar value is defined generally as the market value in the foreign country, excluding U. S. import duties, ocean freight, and marine insurance. Figures not checked by Tariff Commission. The figures do not include 66,082,000 pounds of tuna received from the Canal Zone, Trinidad, Sierra Leone, Senegal, Ghana, Canary Islands, Ivory Coast, and the Fiji Islands. It is understood that these imports consist entirely or almost entirely of tuna landed in these countries by Japanese fishing vessels for shipment to the United States.
2/Cuban rate not shown.
3/In act correspondence with tariff schedule.
4/On American selling price. Source: U. S. Department of Commerce, Bureau of the Census.
Note: Quantities are shown in pounds unless otherwise indicated.

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COMMUNIST CHINESE FISHERIES DELEGATION EXPECTED:

According to a July 30, 1963, press report (Asahi Evening News), an eight-member fisheries delegation was expected to arrive in Japan from Communist China on or about August 10 for the purpose of attempting to work out a fisheries agreement with the Japan-China Fisheries Council. The Communist Chinese delegation, which was coming at the invitation of the Council and the Japan-China Friendship Society, was scheduled to be in Japan for about three weeks. During their visit they were to inspect fishery facilities, particularly those located in Kyushu. According to the press article, the chairman of the Council and leader of a fisheries mission to Communist China in January 1963, promised that a private agreement on fishery relations would be signed before the end of 1963.

The Fisheries Agency of the Ministry of Agriculture and Forestry corroborated the press report, disclaimed any involvement in the visit or any knowledge of what a fisheries agreement resulting from the visit might contain, and expressed concern that the visit might further complicate the Japan-Republic of Korea fisheries negotiations.

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FIRM CONTRACTS WITH A UNITED STATES SHIPYARD FOR CONSTRUCTION OF FOUR TRAWLERS:

A Tokyo fishing firm earlier this year contracted with a Rockport, Texas, shipyard for the construction of four 62-foot steel shrimp trawlers. As of August 1963 all four vessels were under construction. Completion of the vessels is scheduled for January 1964. Negotiations will then be opened to contract for three additional vessels to be delivered in March 1964. The trawlers are of American design, will be fitted with American manufactured equipment, and will probably operate in the shrimp fishery off the Guianas.

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Japan (Contd.):

LOAN POLICY TO BE LIBERALIZED TO PROMOTE FOREIGN INVESTMENT:

In accordance with the Japanese Government's policy of promoting export trade, the Japan Export-Import Bank (Government-operated) is reported to have decided to increase the amount of loans obtainable for overseas investment. Under this new policy, which was scheduled to go into effect beginning September 1963, Government loans available for investment abroad will be drastically increased from the present limit of 50 percent to a maximum of 70 percent, with interest rates on loans ranging from 5.5-8.0 percent, compared with the current flat rate of 7 percent. By liberalizing loans, the Bank hopes to facilitate Japanese plant exports and promote investments abroad.

Up to now, financial activities of the Bank were primarily centered around extension of long-term loans to Japanese exporters of manufactured products. However, with the progress of industrialization in underdeveloped countries, the Government is becoming increasingly aware of the fact that Japan's trade with those countries can no longer rely only upon export of manufactured products. Besides, the United States and European countries are exerting greater efforts toward promoting trade with underdeveloped nations through investment activities. Thus, the Japanese Finance Ministry and the Bank have reached the conclusion that the establishment of Japanese corporations and joint ventures abroad are becoming just as important as exports of merchandise.

Current Government loan conditions for overseas investments are very stringent compared with those applicable to exporters (who can obtain up to 80-percent Government loans at 4-percent interest, payable in 15 years) and importers (who can borrow up to 70-percent from the Government at 6.5 percent interest, payable in 5 years). The relaxation of loan conditions for overseas investments will permit borrowers to obtain Government loans at interest rates of 5.5, 6.0, 6.5, 7.0, 7.5, and 8.0 percent. Favorable loans for overseas investment will be granted for joint commercial ventures in cases where: (1) the majority of the facilities and raw material (semifinished products), are to be procured from Japan; (2) exports of Japanese parts can be expected to follow on a continuing basis; and (3) there are prospects of regularly remitting profits to Japan. Loans for the purchase of foreign corporation stocks (which heretofore were not authorized by the Bank) will, under the new policy, become obtainable at interest rates of 7.5-8.0 percent, since the Government feels that foreign corporations in many cases can serve as foundations from which to broaden markets for Japanese products and to extend Japanese commercial activities into foreign countries. (Nihon Keizai Shimbun, August 21, 1963.)

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IMPORTATION OF SPANISH-CAUGHT FISH OPPOSED BY JAPANESE TRAWLERS ASSOCIATION:

The announcement that a large Japanese firm is planning to import into Japan frozen fish caught by Spanish trawlers operating out of Las Palmas, Canary Islands, is said to have disturbed the Japanese Overseas Trawlers Association. The members are large fishing companies operating stern trawlers in the Atlantic Ocean. The Association claims that the importation of foreign-caught frozen fish (mainly "monko" squid, sea bream, and octopus) would disrupt the operations of the 30 or so large Japanese stern trawlers already operating in the vicinity of the Canary Islands. The Association is expected to start a campaign against their importation.

Earlier press reports indicated that the Japanese firm concluded a five-year contract with a Spanish fishing company located at Las Palmas to purchase 6,000 metric tons of fish annually from about forty 150-ton Spanish trawlers. As replacement for the Awazu Maru (8,500 gross tons) which is presently serving as a floating freezership and purchasing fish from the Spanish trawlers at Las Palmas, that company planned to dispatch in late August the 8,000-ton mothership Otsu Maru. (Minato Shimbun, August 11; Suisan Keizai Shimbun, August 13, 1963.)

Jordan

ATTEMPTS TO DEVELOP FISHING INDUSTRY IN RED SEA:

A German expert in fisheries from the University of Kiel submitted a report in 1962 on the possibilities of improving the Jordanian fishing industry at Aqaba. This study was made as part of the German technical assist-

Jordan (Contd.):

ance program to Jordan. The report recommended the purchase of modern fishing boats and equipment and the training of Jordanians in the use of those boats and equipment.

Jordan is now negotiating with a Swedish firm to obtain technical and financial help in carrying out the recommendations of this report. The Government of Sweden has been asked to provide financial assistance in the development of the industry. The consumption of fresh fish in Jordan has risen from 161 tons in 1955 to 685 tons in 1961. The Government is also pursuing the question of fishing rights through diplomatic channels with the countries that border the Red Sea. (United States Embassy, Amman, July 24, 1963.)

Republic of Korea

FOREIGN EXCHANGE TO BE AUTHORIZED FOR FISHING VESSELS UNDER ITALIAN-FRENCH CONTRACT:

The Government of the Republic of Korea intends to allocate the exchange within the required time limit in order to avoid invalidating the Italian-French-Korean contract to supply Korea with a large number of fishing vessels. A Fisheries Development Corporation has been organized to handle the program, according to reports the latter part of July. The corporation was expected to be legally registered and inaugurated before the end of July 1963.

Indicative of increasing public recognition of the continuing drawdown of foreign exchange reserves, there were rumors in July that the Korean Government might find it necessary to forego paying the US$4.4 million installment due towards the latter part of that month on credit for fishing vessels, thereby forfeiting $1.1 million already paid to a Franco-Italian consortium of shipbuilders and equipment manufacturers. The Economic Planning Board has been reported especially concerned about the allocation of such a large amount and the Ministry of Agriculture and Forestry equally concerned lest deferral of payment terminate the entire contract.

In January 1963, six Italian businessmen and two French representatives signed a contract with the Government of the Republic of Korea to supply Korea with 159 modern fishing vessels valued at about $58 million. The Italian group will provide about $26 million of equipment including marine motors and other machinery. The French firm will supply equipment valued at about $32 million, including the vessel hulls and equipment.

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CANNED SAURY SOLD TO BURMA:

The Republic of Korea is reported to have sold a total of 5,000 cases (1-lb. talls) of canned saury to the Burmese Government purchasing agency under a new trade agreement concluded with Burma. Reportedly, the sale was contracted at a price of 38 shillings 8 pence (US$5.41) a case f.o.b. Korea, which is 4 shillings 7 pence ($0.64) below the price Japan received for the most recent delivery of canned saury to Burma. The Korea-Burma contract originally called for shipment of 10,000 cases, but the quantity was reduced to 5,000 cases since Korea was unable to export that amount. (Suisan Tsushin, August 22, 1963.)

Mauritania

COMMERCIAL FISHING INDUSTRY TO BE EXPANDED:

Because of a lack of large-scale port and processing facilities, Mauritania (northwest coast of Africa) has profited very little from the productive all-year fishing grounds off its northern coast, a part of which are claimed as territorial waters. An estimated 250,000 metric tons of fish are caught in those grounds each year by other fishing nations including Japan. Fishery experts estimate that the grounds could yield up to 350,000 tons without any fear of depletion of the resource.

Although Mauritania's commercial fishery has been largely undeveloped up to the present, it is now entering a stage of intensive development with strong support from the Government. A total of US$5.6 million in public and private investments at Port-Etienne (northernmost port) has already been committed. Facilities planned for Mauritania's fishing industry include a shipyard for construction of small vessels (one 40-foot trawler has already been launched), wharf, refrigerated fish market, freezing plant, pilot can-

Mauritania (Contd.):

nery, a drying and salting facility, and a fishmeal plant. A Canary Islands group will base 20 trawlers at Port-Etienne, and while operating, will train local people as seamen and technicians.

By 1967, the fishery complex is scheduled to be handling 100,000 tons annually of fresh fish, with a commercial value of $12 million. Mauritania's share, in products and income from the 2,500 jobs the industry will create, is estimated at $3.2 to $3.6 million. This will make fishing Mauritania's second most important industry, ranking next to the MIFERMA iron mines (which are scheduled to yield Mauritania some $8 million annually upon reaching full production in 1970).

Off Mauritania's coast, roughly between Port-Etienne and Cap Arguin, is a broad continental shelf beneath approximately 100,000 square kilometers of one of the world's important commercial fishing areas. In that area, mineral salt-laden southbound cold currents and northbound warm currents combine with the shallow depths to form breeding and feeding grounds rich in plankton for enormous quantities of species such as dorado, sole, courbine, octopus, umbrine, mullet, halibut, merou, tuna, sardines, and lobsters.

Those fishing grounds are already under profitable year-round exploitation. Some 250,000 tons of fish are caught annually by an international high-seas fishing fleet of French, Polish, Italian, Japanese, and Spanish vessels. Peruvian trawlers have also been reported, as well as Greek and Portuguese. The largest new exploiters are the Canary Islands Spaniards.

Studies conducted by French Government scientific organizations for the Mauritanian Government have established that the annual catch could be increased to 350,000 tons without harm. To protect the spawning grounds from destructive overtrawling, Mauritania has already closed off the Bay of Levrier (the large inlet in which Port-Etienne is located) to commercial fishing operations. Although Mauritania cannot completely enforce this ban for the time being, it has advanced a claim for extension of its territorial waters to a limit of 12 miles, the inner 6 of which are off-limits for trawling. That step was taken to protect the spawning beds and to guarantee its future share of the proceeds from this important resource.

Only about 15,000 tons of fish is landed in Mauritania for processing. It is processed at Port-Etienne into about 3,500 tons of dried and salted fish by two firms, using hand methods on a small scale to produce a modest output for both home and foreign (mostly West African) consumption. Processing on that small scale has been going on since 1923, although plans for its development into a major industry date back to 1931.

The reasons given for Mauritania's present limited fishing industry are that fish processing on the scale potentially possible requires not only port, canning, and freezing facilities which do not yet exist, but also large quantities of water at low cost, which up to early 1963 have been nonexistent.

A hint of the future of Port-Etienne as a flourishing fishing port and the potential of the Mauritanian fishing industry is the already accomplished fact of a completed shipyard, which in February 1963 launched its first vessel, which was built entirely at Port-Etienne and flying the Mauritanian ensign.

Independence of the Nation, and the completion of the iron ore port at Port-Etienne for shipping out that product have radically modified the fish-processing and port installations picture at Port-Etienne. First, pressed by the new responsibilities of independence to develop all possible resources, the Mauritanian Government has extended the tax and import duty benefits of its investment-encouragement law to the fisheries industry. Second, now a city of some 5,000, Port-Etienne could no longer depend on imported fresh water or expensive desalinized sea water; prospecting by technicians discovered natural fresh water 80 kilometers from Port-Etienne, sufficient not only for human needs but at least temporarily adequate for industrial use.

The result of these developments is the $600,000 shipyard which will employ 400 Mauritanians at peak production, and firm commitments from private and public sources of another $5 million for development of the port and of the entire fishing industry. The projects which are planned, their sources, and the amounts involved are:

1. By a French combine: $1.2 million in private investments for a freezing plant with

Mauritania (Contd.):

a 1,500-ton storage capacity and a daily freezing capacity of 75 tons. Work was scheduled to begin in the second half of 1963, and to be completed by early 1964.

2. By a second French consortium, utilizing a loan of $2.88 million advanced by the Common Market development finance organization FEDOM: An 800-foot fishing wharf, fish market area, and refrigeration system capable of handling by 1966, 30,000 to 40,000 tons of fresh fish annually. The French consortium will also undertake European distribution of a part of the Port-Etienne products.

3. By a Canary Islands fisheries operators group: $1 million in investments for a pilot cannery, an advanced drying and salting facility with a 2,000-ton annual capacity, and a fish-meal plant (the latter to convert into saleable products the 70,000 tons of non-marketable fish now pulled up annually in the trawls only to be thrown back into the sea). Further, the Spaniards are to base a fleet of 20 trawlers at Port-Etienne, and to train Mauritanians aboard them as sailors and technicians.

The latest estimates were that by 1967, the projected fisheries complex will be handling 100,000 tons of fresh fish annually (compared to the present 15,000), processed into 10,000 tons of frozen whole fish, 15,000 tons of frozen fillets, 7,500 tons of salted dried fish, 11,000 tons of fish meal, and 500 tons of lobsters, most of it destined for European markets. (United States Embassy, Nouakchott, July 8, 1963.)

Morocco

CANNED FISH INDUSTRY TRENDS, SECOND QUARTER 1963:

The second quarter of the year marks the beginning of the annual fishing season in Morocco. In general the fish seemed to be biting and there was general satisfaction with the size of the catch.

In June 1963, French dockers refused to unload frozen Moroccan sardines because of the abundant catches in French waters. The same thing occurred last year, and the French and Moroccan Governments agreed this year that Moroccan exports would be suspended from July 15 to September 15. Moroccan plants began operations earlier than usual this year in order to get the fish to France before the deadline. Unfortunately the sardines arrived early off the coast of France. As a result, Moroccan exports of frozen sardines were suspended July 5, and fish plants ceased operations the end of June.

The season for exports of canned fish ended on May 31. Although definite figures are not yet available, it seems that there was no significant improvement in exports over last season. Canned tuna exports, however, did increase substantially (229,122 cases at the end of February against 163,584 last season). Since there is a good market for tuna, Morocco is planning to increase its production still further. There was talk during the second quarter of 1963 of modernizing the fishing fleet, particularly by the addition of larger boats to fish tuna. Although yards exist in Casablanca where such boats could be built, the delivery time is so long that early in July an order for several boats was placed in Norway. (United States Embassy, Rabat, August 2, 1963.)

Norway

COD FISHERY TRENDS, JANUARY 1-JUNE 22, 1963:

The 1963 season's total landings of mature and young cod in Norway during January 1-June 22, 1963, amounted to 91,728 metric tons, compared with 99,488 tons for the same period last year and 136,984 tons in the same period of 1961. Of the 1963 landings, 51,007 tons were sold for drying, 10,330 tons for salting, 22,436 tons for filleting, and 7,955 tons for sale fresh. The season's fishery also yielded 4,460 hectoliters (415 metric tons) of cod-liver oil and 35,761 hectoliters (3,326 tons) of salted, fresh, and canned cod roe.

The Finnmark young cod fishery ended on June 22. The total landings of the Finnmark young cod fishery reached 35,495 tons against 31,218 tons in 1962. (Fisket Gang, June 27, 1963.)

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Norway (Contd.):

EXPORTS OF CANNED FISH, JANUARY 1-JUNE 22, 1963:

Norway's total exports of canned fish January 1-June 22, 1963, were 10.3 percent less than in the same period of 1962. The decline affected all of Norway's principal canned fish products.

Norwegian Exports of Principal Canned Fish Products, January 1 - June 22, 1962-63

Product	1/1963	1962
	. . .(Metric Tons) . . .	
Brisling	2,304	2,393
Small sild	6,427	6,543
Kippered herring	1,534	2,422
Soft herring roe	473	575
Sild delicatessen	202	221
Other canned fish	1,585	1,709
Shellfish	740	920
Total	13,265	14,783

1/Preliminary.

This year, the small sild canning season opened on May 2. The small sild pack during May 2-July 20, 1963, amounted to 152,853 standard cases, down 34.2 percent from the pack of 232,147 cases in the same period of 1962.

The brisling packing season began June 4, 1963. By July 20, 1963, a total of 198,381 standard cases of canned brisling had been packed, a decline of 11.2 percent from the pack of 220,522 cases in the comparable period of the previous year. Brisling quality has been excellent this season. (Norwegian Canners Export Journal, August 1963.)

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ONLY FOUR EXPEDITIONS FOR ANTARCTIC WHALING IN 1963/64 SEASON:

The Norwegian press reports that Norway will send four whaling expeditions to the Antarctic in the 1963/64 season. The ships are Thorshovdi, Thorshavet, Kosmos IV, and Sir James Clark Ross, and they have the entire Norwegian quota of 2,800 blue-whale units. The decision to send Thorshovdi to the Antarctic was taken after the owners had failed to obtain Government permission to sell the modern factoryship to a syndicate of Japanese whaling operators. The Japanese had offered US$1.7 million for the ship, but were primarily interested in the quota of 400 blue-whale units which would have gone with it. The Japanese have already purchased the British ship Southern Harvester, bringing their share of the Antarctic quota up from 41 to 46 percent, and Thorshovdi's 4 percent quota would have given them a dominant share of 50 percent.

Though there appears to be general agreement that Norway's days as a leading whaling nation are over, the Government is concerned to preserve Norway's proportionate share of the Antarctic quota to minimize unemployment problems for whaling crewmen who are now too old to adapt to other types of work. The whaling community of Sandefjord has seen the handwriting on the wall for some years, and the major whaling firms have been diversifying their industrial interests. (United States Embassy, Oslo, August 19, 1963.)

Panama

SPINY LOBSTER INDUSTRY TRENDS:

During 1962, Panama's fishermen on the Pacific side of the Isthmus were paid from 25 to 30 cents a pound for spiny lobsters (with heads on). In the Bocas del Toro area (Caribbean side of the Isthmus), fishermen were reportedly paid an average of $1.50 per dozen spiny lobsters (with heads on).

There are no official statistics on the total catch of spiny lobsters in the Republic of Panama. During 1962, the total spiny lobster catch in all Panamanian waters was about 105,000 pounds, according to an estimate by the Panamanian Ministry of Agriculture, Commerce and Industries.

There are no official export statistics on lobsters. The same official estimates that about 50 percent of the catch was exported during 1962, the majority to the United States. (United States Embassy, Panama, August 23, 1963.)

Peru

FISH MEAL INDUSTRY FACES PROBLEMS:

Within the past several spring and summer months, the Peruvian fish-meal industry entered a difficult period. Overproduction, restricted quotas, increased costs and taxation, and a lack of discipline within the industry all have contributed. Many operators are short of working capital and local banks as of early

Peru (Contd.):

August 1963 were refusing credit, except for fish meal which can be sold immediately under the Peruvian quota. Many companies face imminent bankruptcy and it has been charged that deliberate efforts are being made by some large established producers to "break" newer and smaller enterprises. Practically all companies are overextended and numerous cases of nonpayment of debts have been reported. During July 1963, the local association of shipyard owners and the fishermen's union requested Government assistance on an urgent basis to prevent the fish-meal and collateral industries from collapsing. It has been charged that foreign interests are gaining control of the industry.

A number of United States companies presently are engaged in the fishing industry in Peru. At least five United States firms have interests in Peruvian fishery plants. (United States Embassy, Lima, August 8, 1963.)

South Africa Republic

JAPANESE VESSEL UNLOADS TUNA AT EAST COAST PORT:

Nearly 200 tons of frozen tuna, valued at about R34,000 (US$47,400), were discharged in Durban in June 1963 from the Japanese long-line fishing vessel Nanryu Maru. This was the first of what is expected to become a regular succession of similar cargoes. The fish was to be loaded into cargo ships with refrigerated space and taken to Japan.

The tuna, deep frozen on the fishing vessel, attracted considerable attention as it was lifted out of the hold and moved by fork-lift trucks to a cold-storage warehouse.

Watching the discharge of the fish (which included yellowfin, big-eyed, and albacore or longfin tuna as well as swordfish and some shark fins and tails) was the representative of the Japanese fishing firm which owned the vessel. He said that the transshipment of fish from Durban was in the nature of an experiment. Other fishing craft would also bring their catches to Durban this winter and if the scheme for transshipping them to Japan was successful it would become a regular feature of the tuna season in the Indian Ocean off southern Madagascar. In the past, he said, fishing vessels had carried their catches from the tuna grounds all the way back to Japan. Consequently they were each able to make only two trips a season. By bringing the fish to Durhan, the vessels would be able to spend at least twice as long as previously on the fishing grounds.

As of mid-1963 there were only 2 vessels working off Madagascar, but 4 others were fitting out in Japan to come to those waters to fish when the season reached its height.

Tuna fishing off Madagascar was reported not good and the Nanryu Maru had taken nearly twice as long as normal to fill her holds. But fishing was expected to improve as the season progressed.

Most of the tuna caught off Madagascar is destined for the canneries of the subsidiary of the Japanese firm which owns the vessel.

The shark fins and tails will be sold to Chinese buyers. The next consignment of fish was not expected to reach Durban until late July or early August 1963. (The South African Shipping News and Fishing Industry Review, July 1963.)

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PILCHARD-MAASBANKER FISHERY, JANUARY-MAY 1963:

The catch of the pilchard-maasbanker fishery off the Cape west coast of South Africa Republic in the first 5 months of 1963 was 299,251 short tons pilchards, 12,460 tons maasbanker, and 14,634 tons mackerel; a total of 326,345 tons. By the end of May last year 396,779 tons pilchards, 52,405 tons maasbanker, and 19,287 tons mackerel had been caught; a total of 468,471 tons. At the end of May 1961 the total catch was 419,422 tons and for the same period in 1960 it was 284,941 tons.

According to figures released by the Division of Sea Fisheries, the May 1963 catch was 61,012 tons pilchards, 4,787 tons maasbanker, and no mackerel. This compares with 43,123 tons pilchards, 46,884 tons maasbanker, and 3,732 tons mackerel in May last year; and with 60,205 tons pilchards, 14,362 tons maasbanker, and 1,986 tons mackerel in May 1961.

The May 1963 catch yielded 15,253 short tons fish meal, 1,315,114 imperial gallons

South Africa Republic (Contd.):

fish body oil, 1,246,632 pounds canned pilchards, and 383,760 pounds canned maasbanker.

During May, the pilchard industry at Walvis Bay, South-West Africa, caught 80,759 short tons and the 1963 season total to the end of May was 195,304 tons. (The South African Shipping News and Fishing Industry Review, July 1963.)

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FISHERIES DEVELOPMENT CORPORATION OF SOUTH AFRICA TO EXPAND:

Far-reaching plans to enlarge the Fisheries Development Corporation of South Africa Ltd. and to extend its activities into two more important fields--fishing harbors and resource development work--are indicated by the appointment in July 1963 of a new general manager for the Corporation.

Formed in 1944 under Section Two of the Fishing Industry Development Act, the Corporation was created as a semipublic body with half its capital of R2 million (almost US$2.8 million) subscribed by the State.

In its history of nearly 20 years the Corporation has played a substantial part in the development of the inshore fishing industry, assisting in the financing of new factories, in housing projects, and in the purchase of fishing craft.

It has also helped the South African Division of Sea Fisheries in the financing of research vessels and laboratories, and it now moves into an important new phase by taking over the planning, building, and possibly, at a later date, the administration of fishing harbors along the South African coast.

This arrangement will at last bring near to an end the system under which the already heavily burdened Division of Sea Fisheries had to watch over harbors paid for by the Department of Commerce and Industries but designed and built by another agency. The Division of Sea Fisheries will continue at present to administer the harbors, but the work of planning and building will now be taken on by a team of engineers employed by the Corporation.

In addition to its responsibility for harbors, the Corporation will now also embark on resource development work, leaving the research section of the Division of Sea Fisheries to concentrate on its long-term conservation research work.

The Corporation in its resource development work would focus particularly on spreading the South African catching effort over more species of fish. Work would be done on finding the best possible gear and methods for tuna fishing, and early efforts would be made to find out if shrimp and anchovies (known to be in Southern African waters) could be caught commercially.

From announcements of harbor projects made in May and June, the harbor section of the Corporation is going to be very busy for years to come. Starting from the Berg River, the following are some of the projects planned:

A channel is to be cut through from the sea to the Berg River estuary between Laaiplek and the sandbar-choked river mouth. This will open the calm reaches of the river to dozens of large pilchard boats and will also enable catches to be discharged right alongside the Laaiplek factory of Marine Products Ltd.

Two or three sites are being considered for the placing of a harbor on the southern coast of St. Helena Bay. This harbor will provide a shelter for many of the boats serving the factories in the area.

Improved facilities are being considered for fishing boats in Saldanha Bay.

The largest of all the harbor projects will be in Table Bay where a new fishing harbor is to be built at a cost of about R10 million ($13.9 million). Model tests are now being carried out so that the most suitable site may be selected and this may well be in the Woodstock Beach-Paarden Eiland area of the Table Bay coast.

Extensions, costing about R1 million ($1.4 million) at Hout Bay, will include lengthening the present breakwater, building a new breakwater out from the beach north of the jetty, and the construction of a slipway and repair quay.

Repair slipways are to be built at Hermanus and at Kalk Bay.

Gansbaai harbor, which has become too small for the growing fishing industry of the town, is to be greatly enlarged at an estimated cost of R1 million ($1.4 million).

To further encourage the development of the fishing industry on the Cape south-west coast, investigations will be made into the possibility of building a new harbor at Stilbaai, south of Morris Point. (The South African Shipping News and Fishing Industry Review, July 1963.)

* * * * *

NEW AUTOMATED FISH MEAL PLANT:

In January 1963, what is thought to be the most modern, compact, and highly automated fish-meal processing factory of its size in the world, started operations at Gansbaai in the Cape Province of the South Africa Republic. This new plant can handle 20 short tons of raw fish an hour.

Building took over five months and the equipment of the plant (most of it of South African manufacture) took four months.

Gansbaai is a small village which lies in a reasonably protected bay very near Danger Point. It is 107 miles from Cape Town and 20 miles from the fishing town and holiday resort of Hermanus, and its economy is based on fishing and fish processing. The village's harbor is already becoming too shallow and small for the large shoal fishing boats now using it.

The nearest railhead to Gansbaai is at Bot River, about 50 miles away by road. From there all requirements for the factory and the bagged fish meal and tankers of fish oil are carried to and from the factory by vehicles of the Road Motor Services of the South African Railways and Harbours. The large trucks and trailers are a common sight on the roads in the area. At present the road is tarred only as far as Hermanus but work is in progress to tar the road the whole way to Gansbaai.

Nine boats operate for the factory. Seven of them were built last year in a Cape Town shipyard and the remaining two are fairly new ex-West Coast boats.

Incoming boats with their catches come alongside a concrete quay to be discharged. The jetty is built on reclaimed land, and the catch is discharged by a pump. From the pump the fish are turned out onto a dewatering elevator, constructed of open wire mesh and metal plates, to enable the catch to be drained of water. The elevator (which comprises a conveyor belt operating at an angle of about 45 degrees) was built by personnel from the factory. This elevator raises the catch to a height of about 25 feet to the batch weigher.

Water falling from the dewatering elevator is collected in troughs which run beneath it and is passed into a storage tank for re-circulation in the system. Solids with the water are separated and returned to the batches of fish. Waste and odor are reduced to a minimum.

South Africa Republic (Contd.):

From the dewatering elevator, the fish enter the surge hopper and then the weighing hopper, and are finally discharged into one of six large concrete holding bins. While in the weighing hopper the fish batches are weighed by a large scale capable of registering up to 2,000 pounds at a time. From the scale, the fish are conveyed to the bins by means of a screw conveyor and then another conveyor. The total capacity of the holding bins is 800 tons.

From the holding bins, the fish are screw-conveyed through a gate in the bin wall (the bin in which the fish have been lying for the longest time is emptied first) to a collector conveyor and then into elevating screw conveyors which feed surge hoppers which in turn feed the two continuous screw indirect cookers.

When the mass of fish has been cooked in the cookers, it is screw-conveyed to one of the two presses where it is dewatered. (The South African Shipping News and Fishing Industry Review, July 1963.)

South Africa Republic and South-West Africa

FISHING INDUSTRY STATUS:

Fishing in South African waters has shown a marked increase in importance during recent years, a fact which is highlighted by the increasing numbers of foreign vessels seen to be operating off the coast of Southern Africa, states a report on the South- and South-West African Fishing Industry published in the July 1963 "Barclays Trade Review." The report points out:

The first census ever conducted by the Bureau of Statistics of South Africa's fishing industry brought fresh attention to the magnitude and importance of that industry to the country's economy. The census relates to the 1961 financial year.

A total of 3,882 fishing craft were included in the survey. More than two-thirds of these were rowing and sailing boats, the remainder were 702 motor boats, 69 motor trawlers; and 223 "other" craft (including dinghies with outboard motors).

Catch: A total of 1,030,331 long tons of fish worth R19.7 million (US$27.6 million) were caught during 1961. A little less than one-third of the total catch came from South-West African waters. Processing factories took the greater portion of the fish caught (nearly 88 percent) with the remainder going chiefly to the wholesale fish trade, and a little direct to the retailers.

Statistics relating to the value of fish caught during the period under review have been analyzed by the Bureau into inshore (75 percent of the total catch) and offshore catches, the former being further subdivided according to the various types of fish caught. On the basis of value, pilchard, maasbanker, and mackerel (all inshore fish) formed the major portion of the total catch, with a valuation of R6.5 million ($9.1 million), followed by spiny or rock lobster worth R5.2 million ($7.3 million) and snoek valued at a little over R0.5 million ($700,000). It may be of interest to note that sharks caught during the period were valued at R29,359 ($41,000).

Labor: The fishing industry in South Africa and South-West Africa provided employment for a total of 10,503 persons during the period under review. Of that total, some 2,036 were casual employees only, while a further 4,039 were contract workers (persons who had contracted to operate boats belonging to the owners and to deliver the catch at a stipulated price per ton). The total number of employees was made up of 1,991 whites; 6,495 colored; 1,993 Bantu; and 24 Asiatics.

Salaries and wages paid to those employees amounted to R4.7 million ($6.6 million) in all. Whites earned R1.8 million ($2.6 million); colored R2.6 million ($3.6 million); Bantu R260,000 ($364,000); and Asiatics a little over R7,000 ($9,800). Apart from cash, employees received payments in kind valued at R310,000 ($434,000). This total included the value of fish and other stores given to regular and casual employees as well as provisions required by trawlers and other boats.

Finances: The survey reveals that total assets of the fishing industry in South Africa and South-West Africa amounted to R11.1 million ($15.5 million) in the period under review. Expenditure for the census year amounted to some R17.5 million ($24.5 million), while income totaled R20.4 million ($28.6 million), giving a profit of R2.9 million ($4.1 million) on fishing operations of which some R2.1 million ($2.9 million) accrued to South African operators.

New capital expenditure in the census year is estimated at a little over R2.5 million ($3.5 million). The report also discloses that fishing boats and trawlers currently operate from 22 harbors in South Africa and from Luderitz and Walvis Bay in South-West Africa.

Other Nations Interested in Fishing Grounds off South Africa: Five foreign countries have already shown interest in the rich fishing grounds off South Africa's west coast. They have sent their trawlers and research vessels to the Cape to see what that part of the South Atlantic has to offer. The Russians were the first to arrive in 1961. They have brought with them floating factories and are said to be taking everything they can find out of the sea. They were followed by the Japanese. Early this year the Spaniards arrived, followed by the Belgians. In June Israel sent a research trawler to the Cape with a promise that they would be back next year to fish.

This might be only the beginning, for according to the head of a local fishing firm who has just returned from Europe, the Germans, the Dutch, the Scandinavians, and the British have ideas of going south, for they know that off South Africa's west coast they can supplement their present catches in the North Sea, the Barents Sea, and off Newfoundland.

Realizing the threat to the local industry, the South African Government has defined by law the territorial waters and the fishing zones of the Republic and South-West Africa. The Territorial Waters Act, recently promulgated but not yet proclaimed law, extends the territorial waters of South Africa and South-West Africa from 3 to 6 miles. It also provides for a fishing zone extending 12 miles from the shore (including South-West Africa), in which the Government will exercise the same rights and the powers as it does in the 6 miles territorial zone.

The Government's decision to extend the breadth of South Africa's territorial waters to 6 miles and its fishing zone to 12 miles, is a unilateral action. There appears to be no reason why other countries should not recognize the 12 mile zone off South African shores, but whether South Africa can determine the fishing limits off South-West Africa is another matter. There is a chance that some foreign country may dispute the right of South Africa to determine the offshore limits of a mandated territory.

Another consideration here is the enforcement ability of the small South African Navy, which must cover 2,800

South Africa Republic and South-West Africa (Contd.):

miles of coastline (including the 966-mile South-West Africa coast) with 4 antisubmarine frigates, 12 smaller minesweepers, and a dozen smaller patrol craft. Some local sources have indicated that the enforcement problem is one reason for delaying proclamation of the new limits. (United States Consulate, Cape Town, August 13, 1963.)

Note: Values converted at rate of R1 equals US$1.40.

South-West Africa

TUNA FISHING PLANNED:

Full-scale commercial tuna fishing (in addition to trawling for bottomfish) is to be started within the next year at Walvis Bay, South-West Africa. Negotiations are now under way with the harbor authorities to acquire ground within the harbor precincts for the erection of cold-storage facilities to handle up to 20,000 tons of fish. The plan is to export the tuna and white fish.

This year the same group that is planning to fish tuna and bottomfish was awarded an additional pilchard quota of 5,000 tons to process pilchard fillets for export in frozen form.

To catch the extra quota of pilchards, the white fish, and the tuna, the group is planning a big fleet expansion program. Two boats will be built to catch the tuna and the extra pilchard quota. The plan is to construct a stern trawler for white fish. (The South African Shipping News and Fishing Industry Review, July 1963.)

Tahiti

JAPANESE FIRM EXPLORING PROSPECTS OF TUNA BASE:

The prospects of establishing a tuna fishing base at Tahiti, Society Islands (French), is the purpose of a visit to that Island by the chief of the fishing department of a large Japanese fishing company. According to earlier press reports, the firm initially submitted an application in spring 1962, to construct in Tahiti a tuna base (complete with large freezing facilities), together with a large United States tuna packer and a French firm. Reportedly, the proposal was looked upon favorably by the Japanese Government and Tahitian authorities, but approval was not granted by the French Government in Paris. (Shin Suisan Shimbun Sokuho, August 21, 1963, and other sources.)

U.S.S.R.

EIGHT FISH FACTORYSHIPS ORDERED FROM WEST GERMAN SHIPYARD:

The Government-owned shipyard at Kiel, German Federal Republic, has received from the U.S.S.R. an order for eight floating fish factories with a tonnage of approximately 17,000 tons deadweight each. The total value of the order is DM 250 million (US$62.5 million). According to several German periodicals of August 28, the contract for the order was signed in Moscow on August 26 following lengthy negotiations initiated in January 1963 and interrupted several times.

Reportedly, the factoryships will be propelled by Diesel engines with a capacity of 5,700 hp., permitting a speed of 14 knots. They will be equipped with fish processing, preservation, refrigeration, and canning plants for the production of various fish products including fish meal and fish oil. The U.S.S.R. hopes to double its fish catch once these factoryships are operating at full blast. Delivery is scheduled for 1965 and 1966. (United States Embassy, Bonn, August 29, 1963.)

United Arab Republic

INTEREST IN FISHING INDUSTRY GROWS:

At the present time, according to figures attributed to the Marine Wealth Organization, 60 percent of the fish eaten in Egypt is the product of inland lakes, while the Mediterranean and Red Sea coasts supply only 18 percent. To help correct this imbalance, the Egyptian General Marine Wealth Organization is planning a modern fishing fleet of 50 45-ton vessels, all of which will be built in United Arab Republic (UAR) shipyards. The fleet would be expected to catch 4,750 metric tons of fish yearly, thereby saving ŁE4 million (US$9.2 million) presently being spent on fish imports.

The Organization also reports the signing of an agreement to form a joint Sudanese-UAR

United Arab Republic (Contd.):

fishing company and the prospects of forming a joint Yemeni-UAR fishing company. The UAR-Sudanese company will outfit a fleet to fish in Sudanese territorial waters and will establish canning, drying, and packing plants at Port Sudan. Under the proposed UAR-Yemeni agreement, a whole fishing industry would be established. (United States Embassy, Cairo, August 24, 1963.)

United Kingdom

LARGE FISHING FIRM ACCEPTS ONE OF LAST CONVENTIONAL TRAWLERS:

A new distant-water trawler, the Stella Sirius, expected to be one of the last conventional trawlers to be built by her owners, sailed from Hull, England, on July 20, 1963, on her maiden voyage. The owners of the vessel, a large British fishing firm, announced that the completion of the sister ship Stella Altair before the end of summer would conclude the firm's current interest in conventional trawler building. All future vessels, some already designed, will represent interesting new developments in stern trawling and freezing at sea.

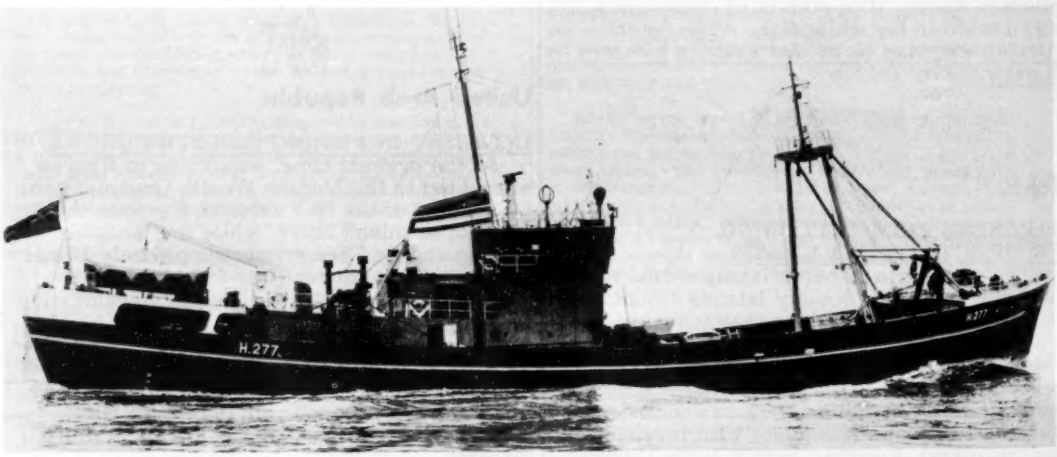
Stella Sirius is the second distant-water trawler to be completed for the British firm this year and the fifth in 16 months. She will be operated out of Hull by a subsidiary company of the owners.

The new vessel, built by a Selby shipyard, is the second of that yard's vessels to incorporate the German "bang bang" type flying gear on the gallows. Launched on March 12, 1963, her completion followed within four months of launching.

The Stella Sirius has been built to Lloyds class 100 A1 specification. Her combined welded-rivetted construction embodies the latest methods of unit prefabrication. The design incorporates a flush deck, flat-bar keel, cruiser stern, flared cruiser bow, and bar stem of clipper form. The three-tier midship deckhouse structure has a forward raking wheelhouse front.

Main dimensions are: 175'0" between perpendiculars, 194'9" over-all length, 32'6" moulded breadth, and 16'9" moulded depth. Cabin accommodation for a crew of 25 has been arranged.

She has a fishhold of 17,500 cu.ft. capacity. It is insulated throughout. All shelf boards and division boards, fixed wing bulkheads, and stanchions are of aluminium alloy. Much of the space is close-shelved. A 4-cylinder, automatic, electrically-driven refrigerator compressor is fitted in the engineroom for fish-hold cooling.



The distant-water trawler Stella Sirius. Her owners, a large British fishing firm, announced that she is one of the last conventional trawlers to be built for them.

United Kingdom (Contd.):

Propulsion is by an 8-cylinder, direct reversing 4-stroke Diesel engine. Supercharged and intercooled it develops 1,600 s. hp. (cont.) at 265 r.p.m. utilizing a conventional straight-through system of power transmission to the "Nikalium" propeller. The engine is fresh-water cooled. Two auxiliary engine sets are provided. She is equipped with the latest electronic instruments.

THE TWELVE SEAS OF THE SOVIET UNION

The shores of the Soviet Union are washed by a unique variety of seas; they range from the fully marine, such as the Barents Sea, to brackish waters like the Sea of Azov, in which the salt content is only a third that of normal sea water; from oceanic, arctic seas to semitropical, landlocked ones such as the Caspian or the Black Sea. In depth, the smallest may average only about 30 feet, the largest (Bering) has depths of over 15,400 feet or nearly three miles.

The Barents Sea, well known to British fishermen, has bottom temperatures of less than 32° F. and a considerable ice-cover during winter. In the Black Sea the bottom temperatures do not fall much below 48° F., even in winter, although the northern coastline ices up. Both the temperature and the salt content play a decisive role in the distribution of animals and plants, and the great variety of conditions among the twelve seas ensures that no two of them are alike as to their vegetation or animal life.

Great fisheries take place in all the seas and a Moscow fish shop would display canned plaice from the White Sea alongside canned Azov anchovies, or jellied sturgeon from the Caspian, and pink salmon caviar from the Far East, besides a variety of fresh-water fish.

Since the mid-18th century, many expeditions have visited all those seas, and it can be fairly stated that the Russians have made a tremendous effort to investigate their own marine environment and fishery resources. Soviet publications dealing with all aspects of the science of their seas probably number more than 10,000. A great wealth of information on the marine flora and fauna, their distribution and abundance, commercial fisheries, physical and chemical oceanography, and marine geology has been amassed.

The twelve seas are divided into three natural groups--the Northern Seas (Barents, White, Kara, Laptev, Chukotsk, and Baltic Seas), the Southern Seas (the landlocked Black, Caspian, and Aral Seas, and the Sea of Azov), and the Far Eastern Seas (the Bering Sea and the Seas of Japan and Okhotsk).

A fascinating recent aspect of Soviet marine biology has been the transplanation and acclimatization in different seas, particularly the southern ones, of marine fishes, and of some of their bottom-living food animals, and even of the microscopic vegetation on which these latter feed.

Some of the seas pose particularly interesting problems. For instance, there has been a general warming-up in Arctic regions over the past 40 years, present temperatures standing some 9 degrees higher than those of the period 1916-1920. This brought about great changes in the flora and fauna of the Barents Sea, and in fact heralded the return of the one-time cod fishery to the Bear Island banks. (The Fishing News, British fishery periodical, July 26, 1963.)

FEDERAL ACTIONS

Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

"CLAMCHIP" FIRM TO GET LOAN:

An industrial loan of $213,200 for producing a new fishery product--"clamchip"--has been approved by the Area Redevelopment Administration (ARA). The ARA loan was made to the Chesapeake Clamchip Corporation of Cambridge, Md. Total cost of the new project to establish facilities for the manufacture of "clamchips" will be $328,000. In addition to the 4-percent 15-year ARA loan, the National Bank of Cambridge will make a loan of $60,000, the State will provide $16,400, and the applicant $22,000 as equity. The funds will be used to buy and improve land, construct a building, and purchase machinery and equipment for producing "clamchips." Twenty-seven workers will be employed at the new plant.

Department of Commerce and Department of the Interior

POLICY DEVELOPED TO PREVENT HIGHWAY CONSTRUCTION DAMAGE TO FISH AND WILDLIFE:

A joint policy of coordinated planning designed to protect and enhance fish and wildlife habitat at Federal-aid highway projects, was announced on August 26, 1963, by Secretary of Commerce, Luther H. Hodges and Secretary of the Interior, Stewart L. Udall. Methods for implementing the policy were worked out by the U. S. Bureau of Public Roads and the U. S. Fish and Wildlife Service.

Secretaries Hodges and Udall said the joint policy recognizes that in order to achieve maximum effectiveness in the expenditure of public funds and at the same time protect wildlife, close coordination and cooperation are required in the planning and construction of highways which have an effect upon fish and wildlife preservation programs. In addition to national cooperation, the success of the joint policy also will require mutual cooperation of State highway departments and State fish and wildlife agencies, the Secretaries said. The joint policy requires that State highway departments supply to State fish and wildlife agencies advance plans for Federal-aid highway development programs. It will be the responsibility of the State fish and wildlife agencies to review the highway programs and make recommendations on ways to develop highway projects which will be compatible with fish and wildlife habitat.

The policy is implemented through a U. S. Bureau of Public Roads Regulation which requires that by January 1, 1964, each State, in requesting Department of Commerce approval for the use of Federal-aid highway funds, must certify that it has given consideration to the effects of the proposed highway project on fish and wildlife resources. The certification from the State also will specify what actions it proposes to take in a highway construction project to protect fish and wildlife habitat. In the event a State highway department declines to accept State fish and wildlife recommendations on any projects, the recommendations--along with the reasons for declining acceptance-must be sent to the U. S. Bureau of Public Roads for consideration.

The joint policy was worked out after meetings with members of Congress who were seeking coordination of the Federal-aid highway and fish and wildlife preservation programs.

Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

NEW AND AMENDED FEDERAL STANDARDS FOR GRADES OF FISH STICKS AND FISH PORTIONS:

Voluntary standards for grades of (a) frozen fried fish sticks, (2) frozen fried fish portions, and (3) frozen raw breaded fish sticks were announced in the August 31, 1963, Federal Register and became effective 30 days from this date. The latter two standards are the first issued by the Department of the Interior prescribing Government standards for those specific commodities. The proposed standard for frozen fried fish sticks is an amendment to the standard previously promulgated in the Federal Register, September 1, 1960. The voluntary standards were unchanged from the proposed voluntary standards published in the May 22, 1963, Federal Register. (See Commercial Fisheries Review, July 1963 p. 100.)

All of the standards include product and grade descriptions as well as a method of determining the grade which involves factors of quality such as flavor, odor, appearance, character, and absence of defects. The standards also contain definitions and methods of analysis, and tolerances for certification of officially drawn samples.

The products covered by the proposed standards are partially defined as follows:

1. Frozen fried fish sticks weigh up to and including $1\frac{1}{2}$ ounces; are at least $\frac{3}{8}$-inch thick, and their largest dimension is at least 3 times the next largest dimension. Frozen fried fish sticks contain not less than 60 percent, by weight, of fish meat. All sticks in an individual package are prepared from the meat of one species of fish.

2. Frozen fried fish portions weigh more than $1\frac{1}{2}$ ounces and are at least $\frac{3}{8}$-inch thick. Frozen fried fish portions contain not less than 65 percent, by weight, of fish meat. All portions in an individual package are prepared from the meat of one species of fish.

3. Frozen raw breaded fish sticks weigh up to and including $1\frac{1}{2}$ ounces; are at least $\frac{3}{8}$-inch thick; and their largest dimension is at least 3 times the next largest dimension. Frozen raw breaded fish sticks contain not less than 72 percent, by weight, of fish meat. All sticks in an individual package are prepared from the meat of one species of fish.

Currently there are 14 fishery products standards. Promulgation of the two new standards (frozen fried fish portions and frozen raw breaded fish sticks) completes the standardization of 95 percent of the products produced from fish fillet blocks.

A proposed revision of the standard for raw breaded fish portions was published in the Federal Register, August 16, 1963.

United States District Courts

COURT RULINGS DIFFER ON EMPLOYMENT STATUS OF FISHERMEN FOR FEDERAL TAX PURPOSES:

The employment status of fishermen on a "lay or share" basis for employment tax purposes has been the subject of a number of litigation cases which are to be determined by the Federal courts. Varying interpretations of the law have led to confusion in the fishing industry. In an attempt at uniformity, several fishing industry members have challenged the Internal Revenue Service in Federal courts throughout the country. For the most part, the courts have held that fishermen are not employees, but independent contractors for employment tax purposes. The meaning of that court ruling is that the boat owner is not required to withhold income taxes or Federal payroll taxes from the earnings of the captains and deckhands. In some cases, the States also have agreed that unemployment insurance taxes are not due from the boat owners. In one litigation, a Texas court ruled ("Crawford Packing Co. v. United States") that the captains and deckhands were not employees for employment tax purposes. The United States Government has appealed that decision to the Fifth Circuit Court of Appeals. The case has been argued and the decision was pending.

In a Florida Federal Court, it was held that the captains and deckhands of a shrimp boat owner and two other affiliated corporations were not their employees, but were independent contractors under the Federal employment tax statutes. The Federal Government did not appeal those cases. In another case, a Mississippi Federal Court held that

the captains and deckhands were independent contractors ("Gulf Boats, Inc. v. United States") and again there was no appeal by the Federal Government. All of the vessels and fishermen involved in those cases were connected with the shrimp industry.

In a more recent case ("Capital Trawlers, et al v. United States"), according to a ruling handed down on April 9, 1963, by a judge of the United States District Court in Portland, Me., fishing vessel crews and captains who operate under the "share" system, are considered employees for Federal tax purposes. In that case the court held that fishermen performing their services on vessels fishing for ocean perch and groundfish were employees. The court specifically ruled that the relationship between the Maine fishermen and the boat owners was not comparable to the working relationship between the owners and fishermen on the shrimp boats. The Portland case indicated that there was a considerable degree of control by the owners over the fishermen in that they were guaranteed certain earnings in the event of a "broker," that the owners had a good deal to say about who should comprise the crew, and in all instances the owners put their own engineer aboard to oversee the safety of the vessel. None of those factors were evident with respect to the shrimp boats. (National Fisheries Institute Flashes, August 16, 1963.)

Note: See Commercial Fisheries Review, July 1963 p. 107, August 1963 p. 78.

Eighty-Eighth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and

allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

COLLISION AT SEA, REGULATIONS FOR PREVENTING: S. Rept. 477, Authorizing the President to Proclaim Regulations for Preventing Collisions at Sea (Aug. 30, 1963, report from the Committee on Commerce, U.S. Senate, 88th Congress, 1st Session, to accompany H. R. 6012), 12 pp., printed. The Committee reported the bill with an amendment (a typographical change) and recommended passage. Contains purpose and discussion of the bill, Federal Agency comments, and Committee amendment.

The Senate, on Sept. 5, 1963, passed with committee amendment H. R. 6012, to authorize the President to proclaim regulations for preventing collisions at sea. Would authorize the President, on behalf of the United States, to proclaim the international regulations for preventing collisions at sea, 1960, on or after a date fixed by the Intergovernmental Maritime Consultative Organization for application of such regulations by Governments which have agreed to accept them. Such regulations shall thereafter have effect as if enacted by statute, and be followed by all public and private vessels of the United States and by all aircraft of United States registry. However, they shall not apply to inland waters or any territorial waters of the United States. Would repeal the existing international rules for preventing collisions at sea, 1948. Regulations were formulated at the Fourth International Conference on Safety of Life at Sea, 1960 (annex E to the final act of the International Conference on Safety of Life at Sea). Parts of the rules of the International Regulations for preventing collisions at sea were rewritten. Those applying directly to fishing vessels are covered under Rules 9 and 13.

The House, on Sept. 11, 1963, concurred in the Senate amendment to H. R. 6012. The action cleared the bill for the President's signature.

CONSERVATION OF MARINE FISHERIES RESOURCES: H. R. 8296 (Keith) introduced in House, Aug. 28, 1963, to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States; referred to Committee on Merchant Marine and Fisheries.

The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce, on Sept. 5, 1963, held hearings on S. 1988, to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States. Testimony was received from Congressmen, United States Coast Guard officers, a representative of the Alaska State Department of Fish and Game, and the President of the Atlantic Fishermen's Union, Boston, Mass. The hearings were concluded on Sept. 6, 1963, when testimony was received from other Federal Agency officials and representatives of the Gloucester (Mass.) Fisheries Commission, National Canners Association, Boston Fisheries Association, Inc., American Tunaboat Association, and the New Bedford Fishermen's Union.

S. Rept. 500, Prohibition of Foreign Fishing Vessels Within the Territorial Waters of the United States (Sept. 13, 1963, report from the Committee on Commerce, U. S. Senate, 88th Congress, 1st Session, to accompany S. 1988), 13 pp., printed. The Committee recommended passage of the bill with amendments. In addition to technical amendments and amendments for clarity, the Committee amendments would authorize the Secretary of the Treasury to license a foreign vessel to engage in fishing within the territorial waters of the United States or for resources of the Continental

Shelf which appertain to the United States, and to land its catch in a United States port, upon certification by the Secretary of the Interior that such permission would be in the national interest and upon concurrence of any State, Commonwealth, or Territory directly affected.

S. 1988 as amended, declares that it is unlawful for foreign vessels to engage in the fisheries within the territorial waters of the United States and its territories and possessions and the Commonwealth of Puerto Rico or to engage in the taking of any fishery resource of the Continental Shelf which appertains to the United States, except as provided by an international agreement to which the United States is a party. Violators would be subject to a fine of not more than $10,000, or imprisonment not more than 1 year, or both. The bill declares that every vessel employed in any manner in connection with a violation of the act shall be subject to forfeiture and all fish taken or retained in violation of the act or the monetary value thereof shall be forfeited. The responsibility for enforcement is to be shared by the Coast Guard, the Department of the Interior, the Bureau of Customs, and such State and territorial officers as the Secretary of the Interior may designate. Federal district courts are empowered to issue such warrants as may be required for the enforcement of the act. Persons authorized to carry out enforcement activities are given the power to execute those warrants; to arrest, with or without a warrant, any person committing in their presence a violation of the act; and, if as a result of such search they have reason to believe that such vessel or any person on board is in violation of the act, then to arrest such person; to seize any vessel which has been used or which reasonably appears to have been used contrary to the provisions of the act; and to seize, whenever and wherever lawfully found all fish taken or retained in violation of the act. Provides for the seizure and disposal of fish taken in violation of the act, and establishes procedures for setting of a bond by alleged violators. The Secretary of the Treasury would be authorized to issue such regulations as he determines necessary to carry out the provisions of the act.

Report also contains purpose of the bill, general discussion, reasons for legislation, attitude of other nations, section-by-section analysis, and agency reports.

The Senate on Sept. 18, 1963, and the House on Sept. 19, 1963, received a resolution adopted by the Senate of the Commonwealth of Massachusetts memorializing the Congress of the United States to enact legislation providing for a 200-mile offshore limit for taking fish off the New England coast by fishing vessels of foreign countries.

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: Senator Ribicoff, on Sept. 6, 1963, inserted in the Congressional Record (pages 15582-15586), Notice of Proposed Rule Making by the Department of Agriculture as published in the Federal Register Sept. 6, 1963, to revise the regulations for the enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act. The revision, in general, would strengthen the regulations with respect to labeling requirements, conform the regulations with interpretations and policies followed in administration of the act, and clarify certain provisions of the regulations. The principal specific changes that would be made concern labeling, registration, guarantees, coloration of economic poisons, adulteration and misbranding, enforcement, permits for experimental use, and declaration of pests.

The Subcommittee on Agricultural Research and General Legislation of the Senate Committee on Agriculture and Forestry, on Sept. 10, 1963, held and concluded hearings on S. 1605, to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, and to eliminate registration under protest. Testimony was received from representatives of the National Agricultural Chemical Association, the American Farm Bureau Federation, and Federal Agency officials.

PRICE-QUALITY STABILIZATION: The Special subcommittee of the Senate Committee on Commerce, on Sept. 9, 1963, resumed hearings on S. 774, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes. Testimony was received from various public witnesses. The hearings were recessed subject to call.

RESEARCH PROGRAMS: H. Res. 504 (Elliott) introduced in House Aug. 27, 1963, to create a select committee to investigate research programs conducted by or sponsored by the departments and agencies of the Federal Government; referred to Committee on Rules. The House on Aug. 28, 1963, received the report (H. Rept. 718) on H. Res. 504, and on Sept. 11, 1963, by a unanimous record vote of 336 yeas, the House adopted H. Res. 504. The Speaker of the House subsequently appointed the following to membership on the select committee: Representatives Elliott, chairman, Fogarty, Miller of California, Price, Landrum, Brown of Ohio, Anderson, Cleveland, and Martin of California.

VESSEL COLLISION LIABILITY AND VESSEL OWNERS LIABILITY: Vessel and Shipowner Liability in Collisions or other Maritime Casualties (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, 88th Congress, 1st Session), 173 pp., printed. Contains hearings held on May 20 and 22, 1963, on S. 555, to unify apportionment of liability in cases of collision between vessels, and in other maritime casualties; and on S. 556, to limit the liability of vessel owners, and for other purposes. The hearings included statements by Federal agencies and industry personnel; the text of S. 555 and S. 556; and written statements and letters submitted to the Subcommittee.

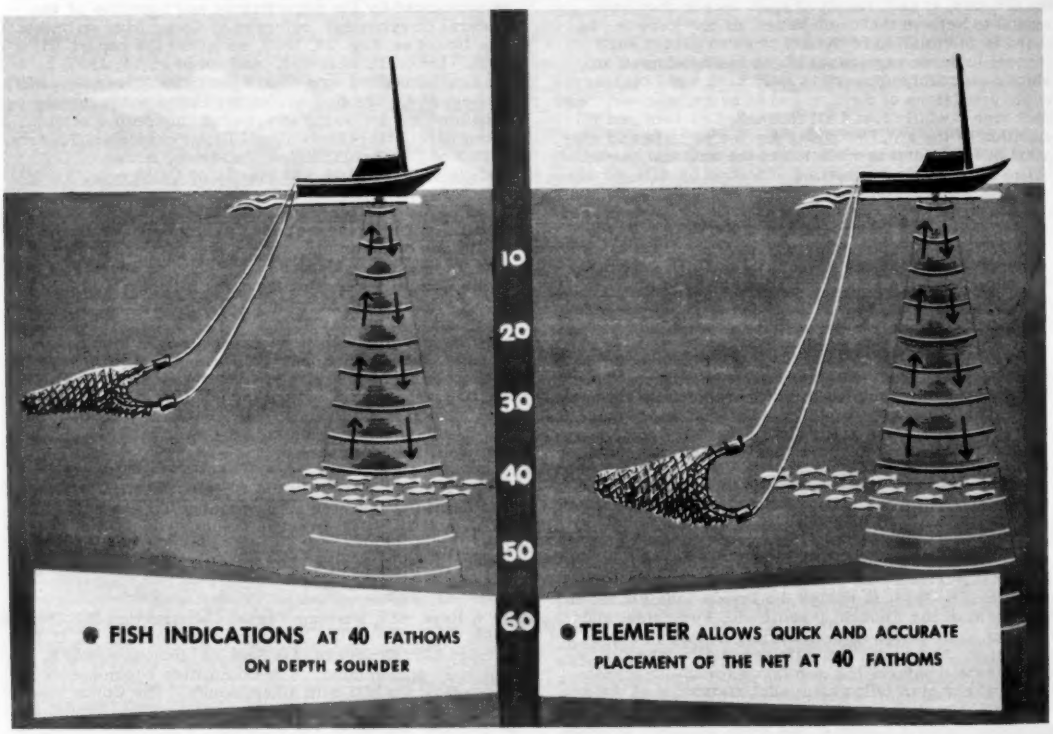
VESSEL CONSTRUCTION SUBSIDY AMENDMENT: The Senate Committee on Commerce, in executive session, Aug. 27, 1963, ordered favorably reported (amended) S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes.

S. Rept. 481, Fishing Vessel Construction Bill (Sept. 9, 1963, report from the Committee on Commerce, U. S. Senate, 88th Congress, 1st Session, to accompany S. 1006), 37 pp., printed. The Committee recommended passage of the bill with amendments. The Committee amendments would provide for a $10 million annual appropriation instead of $12.5 million, and would extend the Program for a 5-year period instead of 9 years. (S. 1006 would provide a subsidy up to 55 percent of the

cost of construction of a fishing vessel in a domestic shipyard, and delete Section 4 from the recently expired Program which limited construction of such vessels to fisheries injured by foreign imports.) Report also contains: purpose of the bill, need for the bill, general discussion including financial aids available to fishing vessel owners in certain other countries, section-by-section explanation, agency reports, changes in existing law, appendix, and the minority view.

WATER POLLUTION CONTROL ADMINISTRATION: The Special Subcommittee on Air and Water Pollution of the Senate Committee on Public Works, on Sept. 5, 1963, resumed its executive consideration of S. 649, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration within the Department of Health, Education, and Welfare.

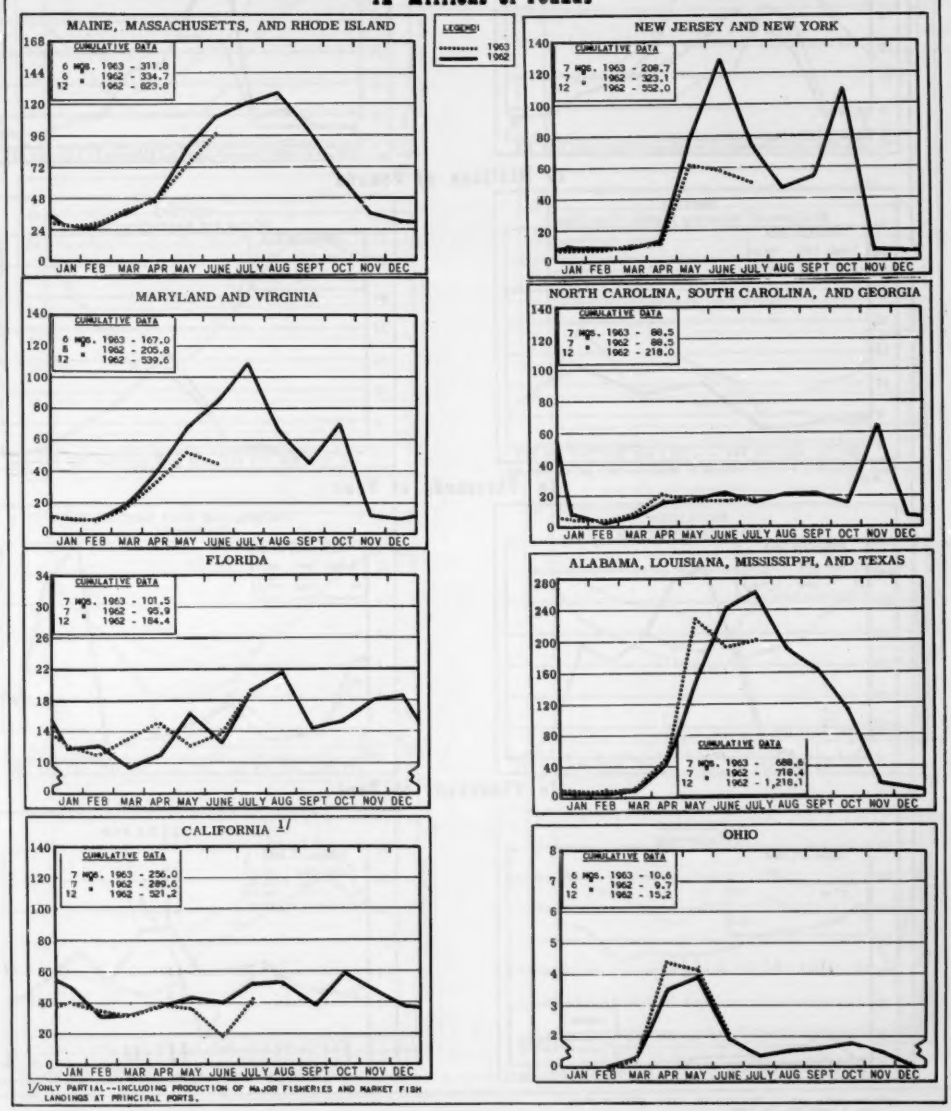
WATER RESOURCES COUNCIL: The Subcommittee on Irrigation and Reclamation of the Senate Committee on Interior and Insular Affairs, on Sept. 12 and 13, 1963, held hearings on S. 1111, to provide for the optimum development of the nation's natural resources through the coordinated planning of water and related land resources, through the establishment of Water Resources Council and river basin commissions, and providing financial assistance to the States in order to increase State participation in such planning. Testimony was received from Congressmen, officials of Federal and State Agencies, and public witnesses. On Sept. 13, 1963, the hearings were adjourned subject to call.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

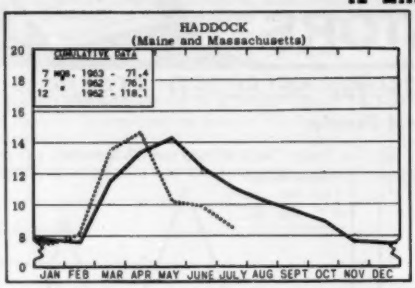
In Millions of Pounds

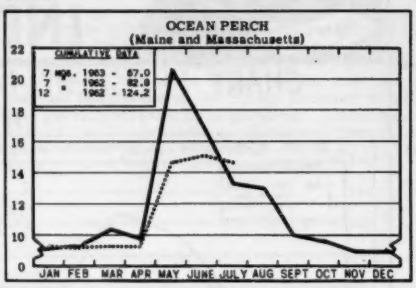

MAINE, MASSACHUSETTS, AND RHODE ISLAND
CUMULATIVE DATA
6 MOS. 1963 - 311.8
6 " 1962 - 334.7
12 " 1962 - 823.8
LEGEND
1963
1962
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
NEW JERSEY AND NEW YORK
CUMULATIVE DATA
7 MOS. 1963 - 208.7
7 " 1962 - 323.1
12 " 1962 - 352.0
MARYLAND AND VIRGINIA
CUMULATIVE DATA
6 MOS. 1963 - 167.0
6 " 1962 - 205.8
12 " 1962 - 539.6
NORTH CAROLINA, SOUTH CAROLINA, AND GEORGIA
CUMULATIVE DATA
7 MOS. 1963 - 88.5
7 " 1962 - 88.5
12 " 1962 - 218.0
FLORIDA
CUMULATIVE DATA
7 MOS. 1963 - 101.5
7 " 1962 - 95.9
12 " 1962 - 184.4
ALABAMA, LOUISIANA, MISSISSIPPI, AND TEXAS
CUMULATIVE DATA
7 MOS. 1963 - 688.6
7 " 1962 - 718.4
12 " 1962 - 1,216.1
CALIFORNIA 1/
CUMULATIVE DATA
7 MOS. 1963 - 256.0
7 " 1962 - 289.6
12 " 1962 - 521.2
OHIO
CUMULATIVE DATA
6 MOS. 1963 - 10.6
6 " 1962 - 9.7
12 " 1962 - 15.2

1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

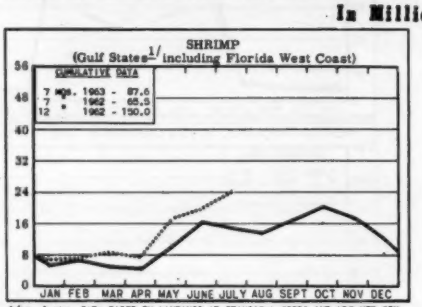
CHART 2 - LANDINGS for SELECTED FISHERIES

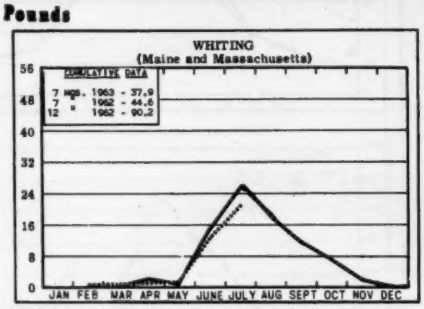
In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
7 MOS. 1963 - 71.4
7 " 1962 - 78.1
12 " 1962 - 118.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
7 MOS. 1963 - 67.0
7 " 1962 - 82.8
12 " 1962 - 124.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

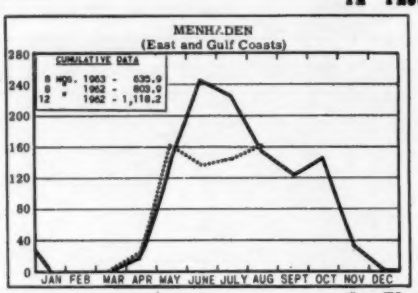
In Millions of Pounds

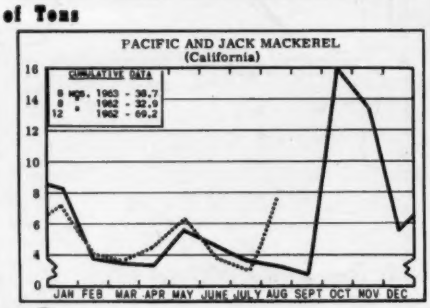

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
7 MOS. 1963 - 87.6
7 " 1962 - 65.5
12 " 1962 - 150.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
7 MOS. 1963 - 37.9
7 " 1962 - 44.6
12 " 1962 - 90.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

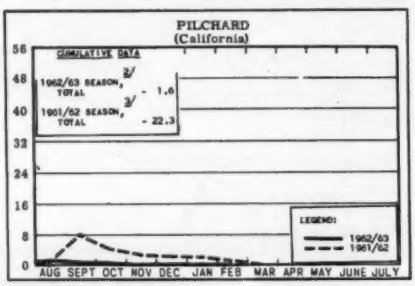
1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

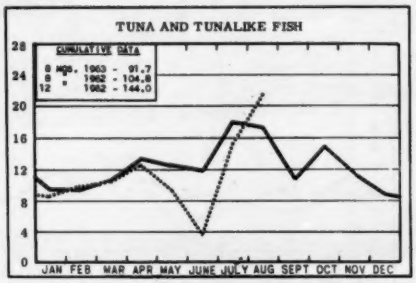
In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
8 MOS. 1963 - 635.9
8 " 1962 - 803.0
12 " 1962 - 1,118.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
8 MOS. 1963 - 38.7
8 " 1962 - 32.0
12 " 1962 - 69.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons

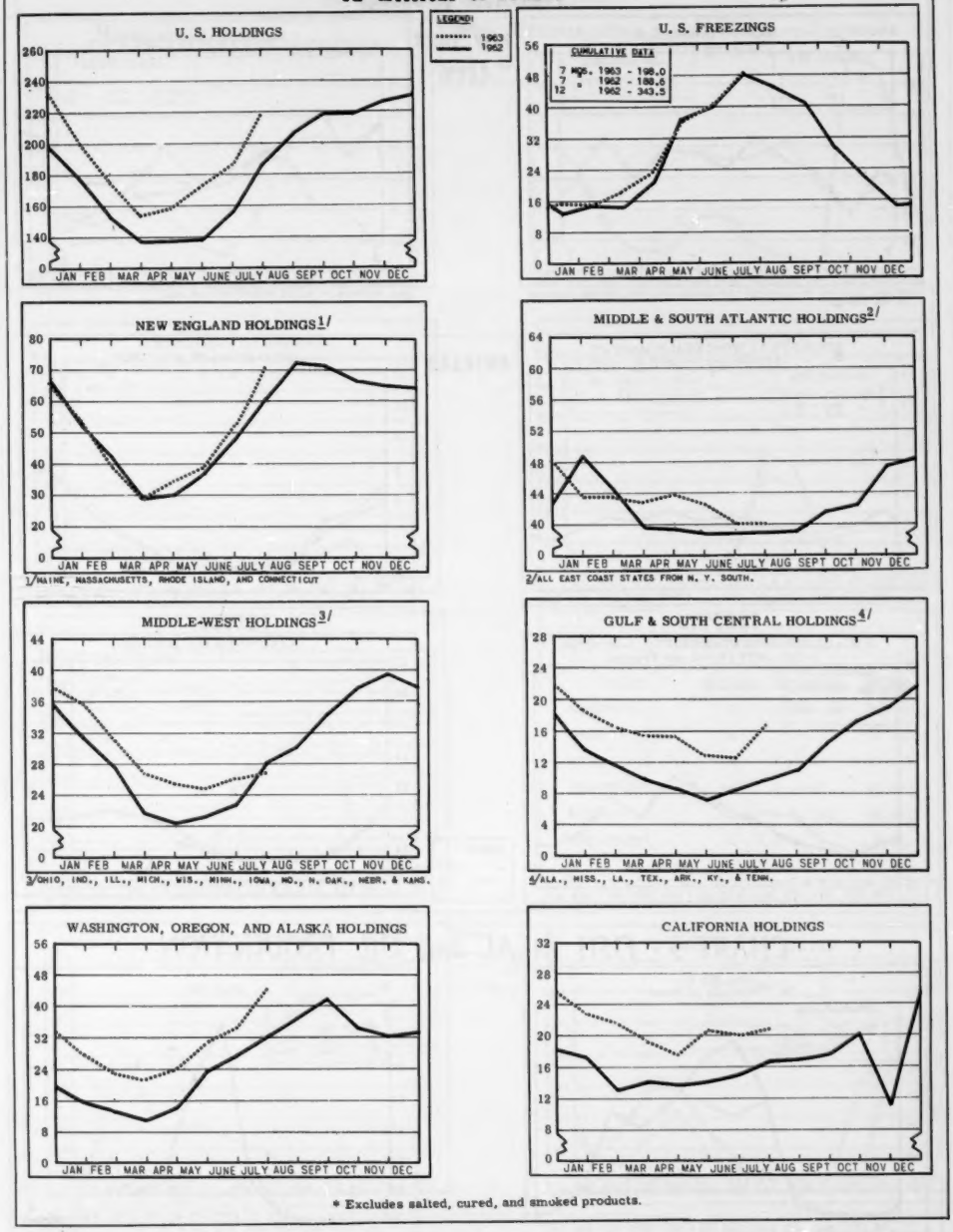



TUNA AND TUNALIKE FISH
CUMULATIVE DATA
8 MOS. 1963 - 91.7
8 " 1962 - 104.8
12 " 1962 - 144.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963. 3/SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. HOLDINGS
LEGEND: 1963 1962
U. S. FREEZINGS
CUMULATIVE DATA
7 MOS. 1963 - 198.0
7 " 1962 - 188.6
12 " 1962 - 343.5
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE-WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

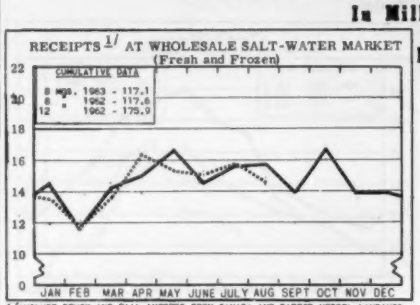
3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

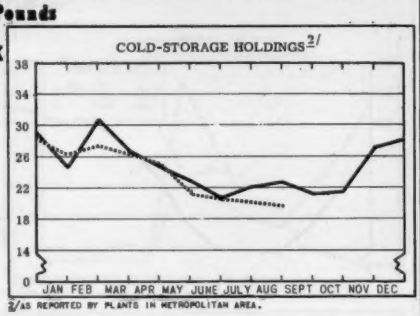
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

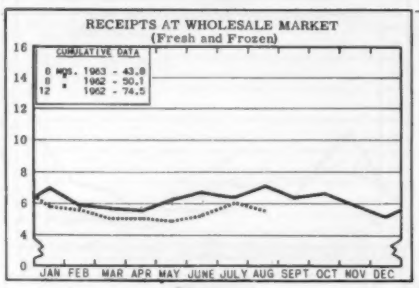

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1963 - 117.1
8 " 1962 - 117.6
12 " 1962 - 175.9
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

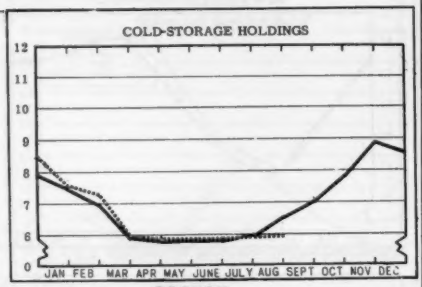
NEW YORK CITY



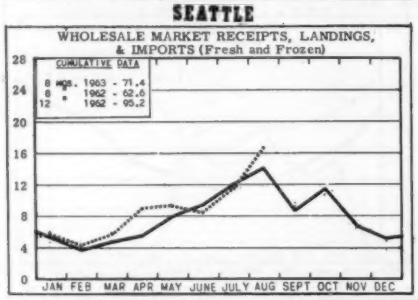
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.


RECEIPTS AT WHOLESALE MARKET
(Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1963 - 43.8
8 " 1962 - 50.1
12 " 1962 - 74.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHICAGO



SEATTLE


WHOLESALE MARKET RECEIPTS, LANDINGS,
& IMPORTS (Fresh and Frozen)
CUMULATIVE DATA
8 MOS. 1963 - 71.4
8 " 1962 - 62.6
12 " 1962 - 95.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

BOSTON

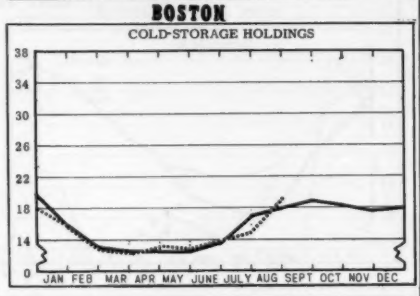
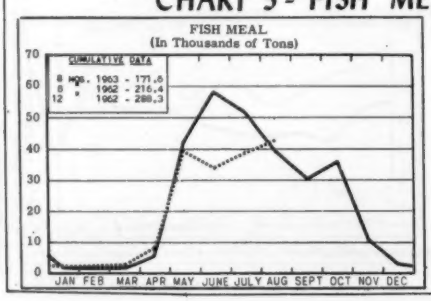


CHART 5 - FISH MEAL and OIL PRODUCTION


FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
8 MOS. 1963 - 171.6
8 " 1962 - 216.4
12 " 1962 - 288.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

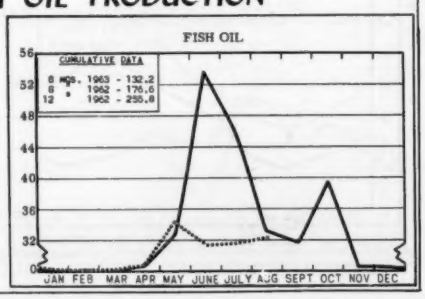
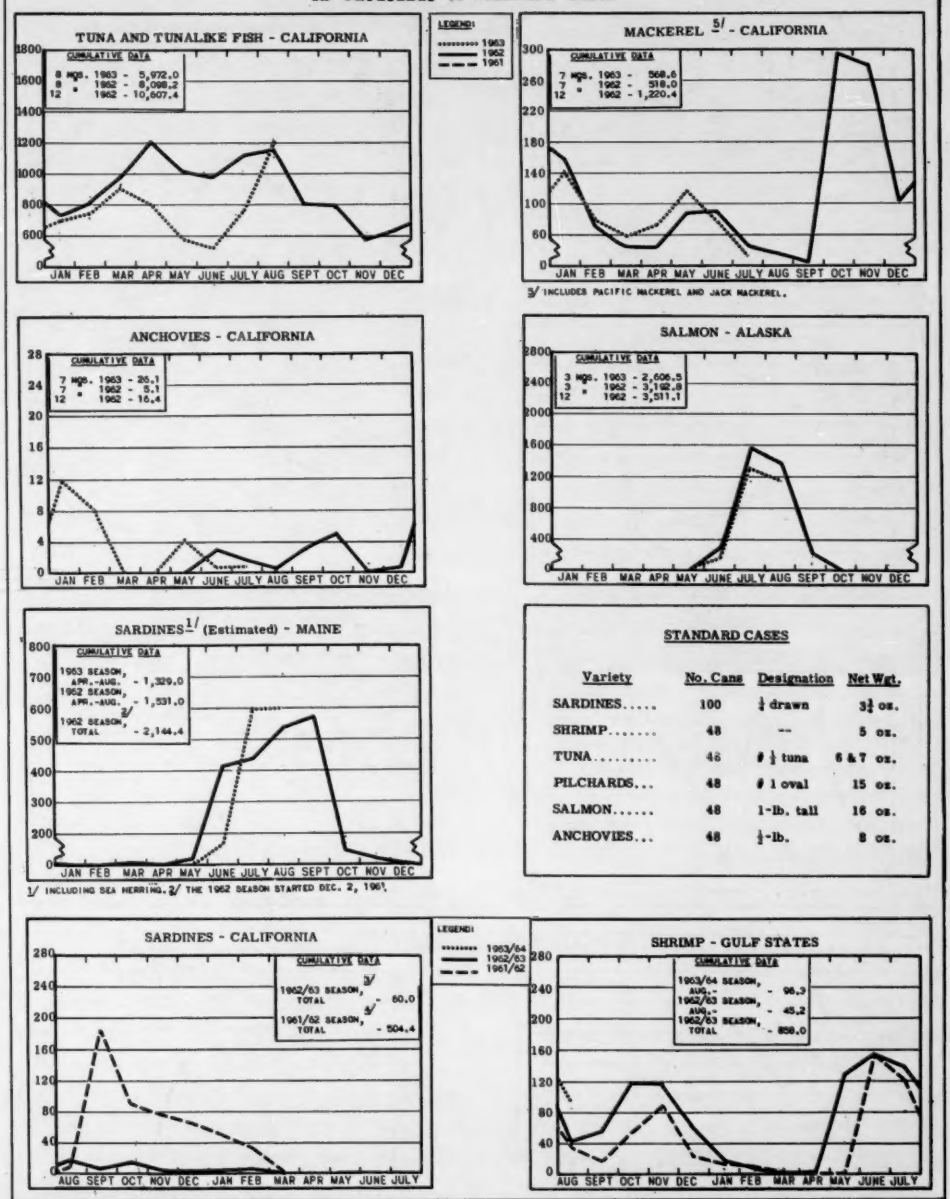


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases


TUNA AND TUNALIKE FISH - CALIFORNIA
CUMULATIVE DATA
8 MOS. 1963 - 5,972.0
8 " 1962 - 8,088.2
12 " 1962 - 10,607.4
LEGEND: 1963 1962 1961
MACKEREL 5/ - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1963 - 568.6
7 " 1962 - 518.0
12 " 1962 - 1,220.4
5/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.
ANCHOVIES - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1963 - 26.1
7 " 1962 - 8.1
12 " 1962 - 16.4
SALMON - ALASKA
CUMULATIVE DATA
3 MOS. 1963 - 2,606.5
3 " 1962 - 3,192.8
12 " 1962 - 3,511.1
SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
1963 SEASON, APR.-AUG. - 1,329.0
1962 SEASON, APR.-AUG. - 1,531.0
1962 SEASON, TOTAL 2/ - 2,144.4
1/ INCLUDING SEA HERRING. 2/ THE 1962 SEASON STARTED DEC. 2, 1961.
SARDINES - CALIFORNIA
CUMULATIVE DATA
1962/63 SEASON, TOTAL 3/ - 60.0
1961/62 SEASON, TOTAL 4/ - 504.4
LEGEND: 1963/64 1962/63 1961/62
SHRIMP - GULF STATES
CUMULATIVE DATA
1963/64 SEASON, AUG.- - 98.9
1962/63 SEASON, AUG.- - 45.2
1962/63 SEASON, TOTAL - 858.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

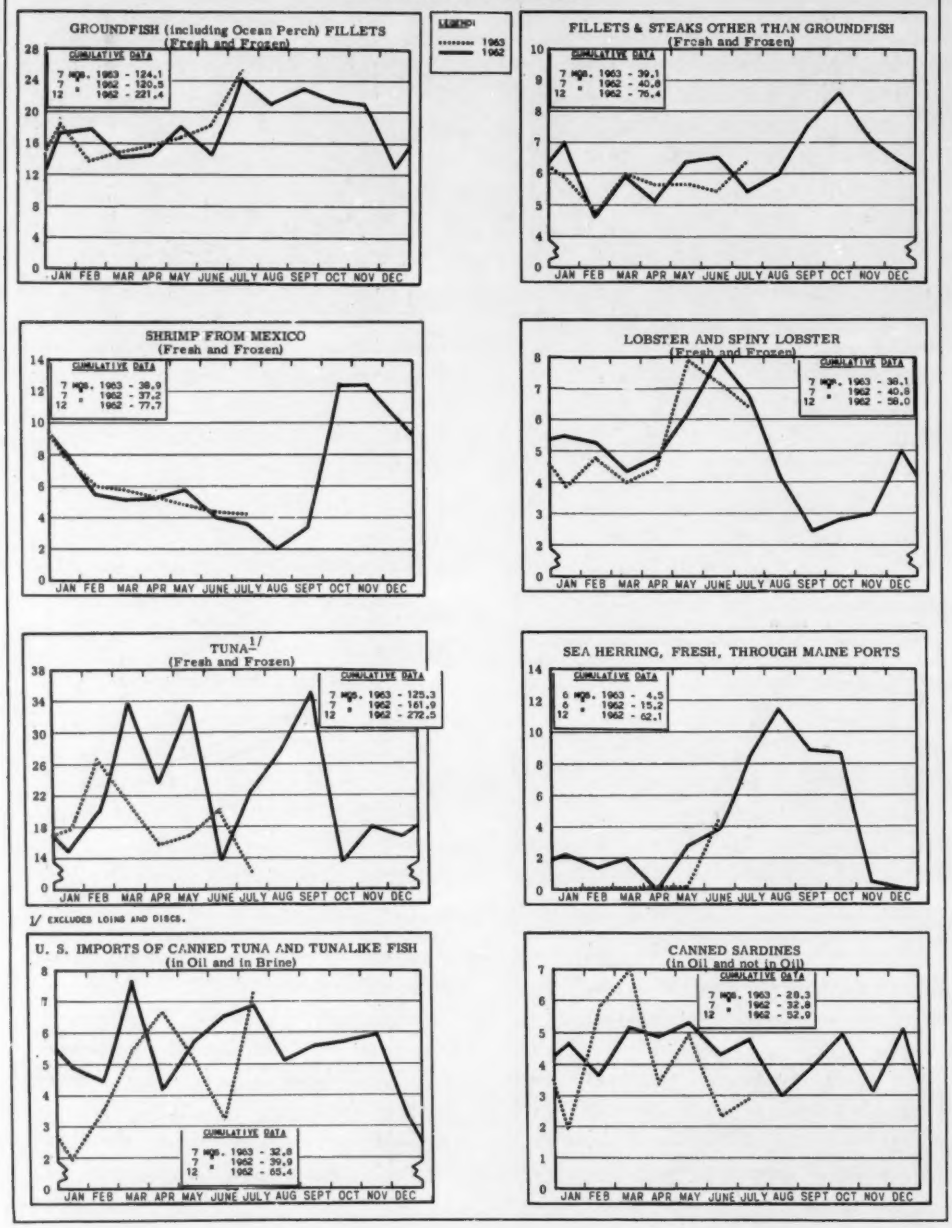
STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.

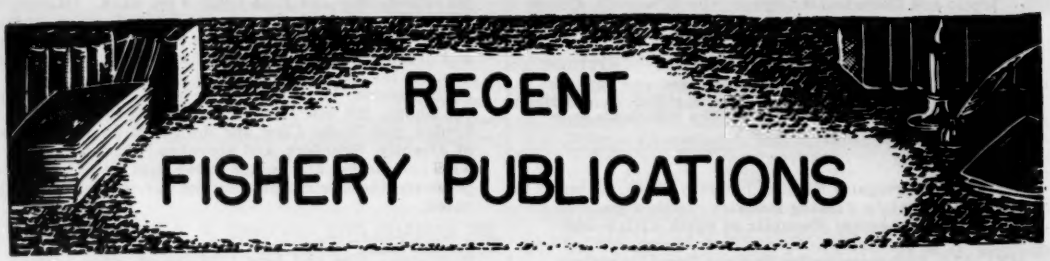
3/ SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963.
4/ SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS
(Fresh and Frozen)
CUMULATIVE DATA
7 MOS. 1963 - 124.1
7 " 1962 - 120.5
12 " 1962 - 221.4
LEGEND
1963
1962
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
7 MOS. 1963 - 39.1
7 " 1962 - 40.8
12 " 1962 - 76.4
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
7 MOS. 1963 - 38.9
7 " 1962 - 37.2
12 " 1962 - 77.7
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
7 MOS. 1963 - 38.1
7 " 1962 - 40.8
12 " 1962 - 58.0
TUNA 1/
(Fresh and Frozen)
CUMULATIVE DATA
7 MOS. 1963 - 125.3
7 " 1962 - 161.9
12 " 1962 - 272.5
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
6 MOS. 1963 - 4.5
6 " 1962 - 15.2
12 " 1962 - 62.1
U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
7 MOS. 1963 - 32.8
7 " 1962 - 39.9
12 " 1962 - 65.4
CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
7 MOS. 1963 - 28.3
7 " 1962 - 32.8
12 " 1962 - 52.9

1/ EXCLUDES LOINS AND DISCS.



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CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

Number Title

CFS-3228 - Massachusetts Landings, by Ports, 1962 Annual Summary, 12 pp.
CFS-3236 - Florida Landings, 1962 Annual Summary, 13 pp.
CFS-3240 - Frozen Fishery Products, June 1963, 8 pp.
CFS-3243 - Wisconsin Landings, May 1963, 2 pp.
CFS-3246 - Louisiana Landings, May 1963, 2 pp.
CFS-3247 - Shrimp Landings, 1962 Annual Summary, 43 pp.
CFS-3248 - New York Landings, May 1963, 4 pp.
CFS-3249 - Maryland Landings, May 1963, 3 pp.
CFS-3250 - Fish Sticks and Fish Portions, April-June 1963, 2 pp.
CFS-3251 - New Jersey Landings, June 1963, 4 pp.
CFS-3252 - Maine Landings, May 1963, 4 pp.
CFS-3253 - Mississippi Landings, May 1963, 3 pp.
CFS-3254 - California Landings, May 1963, 4 pp.
CFS-3255 - Rhode Island Landings, May 1963, 3 pp.
CFS-3265 - Fish Meal and Oil, June 1963, 2 pp.
CFS-3266 - Florida Landings, June 1963, 8 pp.

Wholesale Dealers in Fishery Products, 1962 (Revised):
SL- 3 - Massachusetts, 12 pp.
SL-46 - Texas (Mississippi River and Tributaries), 2 pp.

Sep. No. 685 - New Whiting Products Tested at University of Massachusetts Annual School-Lunch Conference.

Sep. No. 686 - Length-Weight Relationship and Stomach Contents of the Swellfish (Spheroides maculatus) in the York River.

Sep. No. 687 - Equipment Note No. 14--A Light Box for Photographing Fish and Invertebrates at Sea.

Sep. No. 688 - Foreign Fisheries Briefs.

"Effect of Cooking Methods on the Sodium Content of Halibut, Haddock, and Flounder," by Bernard I. Sohn and Maynard A. Steinberg, 7 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2, no. 1, September 1962, pp. 7-13.)

"Mechanically Deicing and Weighing Groundfish at the Dock in New England," by John A. Peters, Joseph W. Slavin, and Arvey H. Linda, 8 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2, no. 1, September 1962, pp.23-30.)

"Methods for Separation of Fatty Acids from Fish Oils with Emphasis on Industrial Applications," by Edward H. Gruger, Jr., 10 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2, no. 1, September 1962, pp. 31-40.)

"New-Type Multiple Debreader," by Melvin E. Waters and D. J. Bond, 9 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2 no. 1, September 1962, pp. 49-57.)

Pesticide-Wildlife Studies: A Review of Fish and Wildlife Service Investigations During 1961 and 1962, Circular 167, 127 pp., processed. Presents sections on commercial fisheries investigations; sport fishery investigations; wildlife studies, Denver Wildlife Research Center; wildlife studies, Patuxent Wildlife Research Center; pesticide-wildlife studies by state, provincial, or university personnel, and by the Cooperative Wildlife Research Units; and recommendations for minimizing dangers of pest control and pesticides to fish and wildlife.

Progress in Sport Fishery Research, 1962, Circular 160, 124 pp., illus., processed, March 1963. This report of sport fishery research for the calendar year 1962 covers the progress made in studies of fish diseases and nutrition of fish, fish-farming experiments, fish-pesticide research, and reservoir investigations. Also includes a list of publications and special reports issued during the year.

"Proximate Composition Changes in Sockeye Salmon (ONCORHYNCHUS NERKA) During Spawning Migration," by Claude E. Thurston and H. William Newman, 8 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2, no. 1, September 1962, pp. 15-22.)

"Storage of Fish in Refrigerated Sea Water. 1--Quality Changes in Ocean Perch as Determined by Organo-

leptic and Chemical Analyses," by Edward H. Cohen and John A. Peters, 7 pp., illus. (Reprinted from Fishery Industrial Research, vol. 2, no. 1, September 1962, pp. 41-47.)

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH STREET NW., WASHINGTON, D. C. 20005.

Number	Title
MNL- 8	- Portugal's Fishing Industry, 1962, 22 pp.
MNL-11	- Spain's Fishing Industry, 1962, 7 pp.
MNL-22	- Fisheries: Republic of South Africa and Territory of South West Africa, 1962, 16 pp.
MNL-57	- Fisheries in the Federal Republic of Germany--Annual Survey, 1962, 23 pp.
MNL-58	- Republic of Korea's Fishing Industry, 1962, 8 pp.
MNL-81	- Fisheries Industry of France, 1962, 14 pp.
MNL-82	- Fisheries of Ecuador, 1961, 12 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, March 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, July 1963, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, July 1963, 10 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists, and thermocline effects on purse seining for tuna; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, June and July 1963, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Room 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; sponge sales; and Gulf menhaden landings and production of meal, solubles, and oil; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May and June 1963, 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--May and June 1963, 16 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesaler's selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1963, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALGAE:

"A Comparison of Polysaccharides of Hypnea musciformis and Chondrus crispus," by R. D. Hamilton and J. J. Carroll, Contribution No. 423, 3 pp., printed. (Reprinted from Nature, vol. 196, no. 4860, December 22, 1962, pp. 1200-1201.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

"Evaluation of Algae as a Food for Human Diets," article, Nutrition Reviews, vol. 21, January 1963, pp. 7-8, printed. The Nutrition Foundation Inc., 99 Park Ave., New York 16, N. Y.

ALGIN:

"Algin--Multi-Use Colloid," by F. X. McDermott, article, Food Engineering, vol. 34, May 1962, pp. 66-73, printed. Chilton Co., Chestnut and 56th Sts., Philadelphia 36, Pa.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ALMANAC:

The Nautical Almanac for the Year 1964, 29P, 311 pp., printed, $2. U. S. Naval Observatory, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402,) Provides data required for the practice of astronomical navigation at sea.

AMPHIBIANS:

Amphibians, by A. M. Nikol'skii, OTS 60-21813, 230 pp., illus., processed, $2.25. (Translated from the Russian, Fauna Rossii i Sopredel'nykh Stran, 1918.) Office of Technical Service, U. S. Department of Commerce, Washington, D. C. 20230, 1962.

ANGOLA:

Preparing Shipments to Angola, OBR-63-85, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D.C., April 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington D. C. 20402.) The report discusses shipping documents; import and exchange licenses; sanitary and other special certificates; labeling, marking, and packing; and related subjects.

ARCTIC MARINE FISH:

Selected Taxonomic Papers on Northern Marine Fishes, by A. P. Andriyashev, OTS 61-31030, 59 pp., illus., processed, 50 cents. (Translated from Russian.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230, 1963.

ARGENTINA:

Basic Data on the Economy of Argentina, by Walter Haidar, OBR-63-84, 24 pp., illus., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., March 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington D. C. 20402.) Discusses, among other items, the fishing industry. Describes the rich fishing zones of Argentina and gives some statistical data on the total catch of salt- and fresh-water fish and shellfish.

Import Tariff System of Argentina, OBR-63-49, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., March 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents information on units of currency, weights, and measures; method of payment of duty; sales, excise, and other taxes; shipping documents; trade restrictions; and related subjects.

AUSTRALIA:

Southern Pelagic Project Two-Monthly Report, No. 13, March 1963, 9 pp., processed. Southern Pelagic Project Laboratory, Camberwell, Victoria, Australia.

BACTERIOLOGY:

"Coliform Bacteria in Sea Water and Shellfish. I--Lactose Fermentation at 35.5° and 44°C.," by A. D. Tennant and J. E. Reid, article, Canadian Journal of Microbiology, vol. 7, 1961, pp. 725-731, printed. National Research Council, Ottawa, Canada.

BONITO:

"Zakonomernosti Raspredeleniya Pelamidy v Chernom More" (Mechanisms Governing the Distribution of Bonito in the Black Sea), by T. G. Lyubimova, article, Rybnoe Khoziaistvo, vol. 8, 1961, pp. 10-13, printed in Russian. V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

BRITISH GUIANA:

The Trawl Survey Carried Out by the R/V CAPE ST. MARY off British Guiana, 1957-59, by W. G. Mitchell and R. H. McConnell, Bulletin No. 2, 53 pp., illus., printed. Fisheries Division, Georgetown, British Guiana.

CALIFORNIA:

The California Marine Fish Catch for 1961, Fish Bulletin No. 121, 54 pp., illus., printed. Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, California, 1963. A summary of the 1961 landings of fish, mollusks, and crustaceans in California by commercial fishing vessels or shipped into the State for processing. Statistical data cover annual landings and shipments, 1916-1961; landings and shipments of leading species by weight and value; number of fishing vessels by length; origin of shipments; origin of commercial fish landings; and monthly landings and shipments, statewide and by areas. Also included are data on value and quantity of annual landings by areas; value of landings by ports and areas; sport fish catch, 1936-1940 and 1947-1961; and live bait catch. Also includes an article, "Catch Localities for Dover Sole, Microstomus pacificus (Lockington), Landed in California, 1950 through 1959," by E. A. Best.

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products for 1962, Circular No. 37 15 pp., printed. California Department of Fish and Game, Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif. This report, the latest in a series of annual reports on commercial fishery production in California, includes statistical tables on landings by species and areas, imports of tuna, and pack of canned fish. Data also cover volume of other types of processed fish, sardine meal and oil production, and the annual pack of sardines, anchovies, tuna, and bonito and yellowtail.

CANADA:

Fisheries Statistics of British Columbia, 1962 (Preliminary), 13 pp., processed. Canadian Department of Fisheries, Pacific Area, Economics Branch, 1155 Robson St., Vancouver 5, B. C., Canada, April 1963. Discusses the total value of fish and fish products produced in 1962 with an analysis of the increase in market value over the previous year; marketing by species, landed and market value, 1950-62, canned pack, and production and utilization of salmon; landings and value of herring and byproducts, halibut, soles, crab and shrimp, and other species; fishing vessels; gear and equipment; and number of licensed fishermen. Includes statistical tables on landings and values by species and by years; landings and manufactured products; salmon pack, 1962; and other similar data.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

CANARY ISLANDS:
"La pesca en las Islas Canarias" (Fisheries of the Canary Islands), article, Boletin de Informacion del Sindicato Nacional de la Pesca, no. 52, January 1963, pp. 12-15, printed in Spanish. Sindicato Nacional de la Pesca, 18-20 Paseo del Prado, Madrid, Spain.

CHOLESTEROL:
"Cholesterolemia and Cardiovascular Sudanophilia in Rats Fed Sardine Mixtures," by S. A. Miller, H. A. Dymsza, and S. A. Goldblith, article, Journal of Nutrition, vol. 77, August 1962, pp. 397-402, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

CLAMS:
"Clam Poison. III--Paper Electrophoresis of Clam Poison," by R. A. B. Bannard and A. A. Casselman, article, Canadian Journal of Chemistry, vol. 40, August 1962, pp. 1649-1655, printed. National Research Council, Ottawa, Canada.

COALFISH:
"On The Growth and Food of O-Group Coalfish, Pollachius virens L., in Norwegian Waters," by Ulf Lie (Institute of Marine Research, Bergen, Norway), article, Biological Abstracts, vol. 39, no. 6, Part 1, 1962, Abstract No. 21815, printed. University of Pennsylvania, 3815 Walnut St., Philadelphia 4, Pa.

COD:
"The Bacteriology of Distant Water Cod Landed at Hull," by R. Spencer, article, Journal of Applied Bacteriology, vol. 24, no. 1, 1961, pp. 4-11, printed. Wallace and Tierman Ltd., Power Rd., London W4, England.

COD LIVERS:
"Sterilization of Cod Livers Aboard and the Production of Cod Liver Preserves," by K. A. Mrochkov, article, Trudy Tekhnologia Rybnykh Productov, vol. 60, 1959, pp. 38-45, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

COMPOSITION:
"L-Threonine Ethanolamine Phosphate: A Compound Newly Isolated from Fish," by H. Rosenberg and others, article, Biochemical Journal, vol. 84, September 1962, pp. 536-541, printed. Cambridge University Press, Bentley House, 200 Euston Rd., London NW1, England.

CONTAINERS:
"American Marine Refrigerated Cargo Containers," by L. L. Westling, article, Bulletin of the International Institute of Refrigeration, vol. XLIII, no. 1, 1963, pp. 26-35, illus., printed. Institut International du Froid, 177, Boulevard, Malesherbes, Paris 17e, France.

"Plastics for the Packaging of Foodstuffs with a View to International Coordination," by L. Robinson-Gornhardt, article, Kunststoffe, vol. 52, no. 2, 1962, pp. 67-71, printed. Carl Hanser, Zeitschriftenverlag, GmbH, Kolbergerstr, 22, Munich 27, Germany.

CRABS:
"Claw Deformities in the Blue Crab," by Carl N. Shuster, Jr., David H. B. Ulmer, Jr., and Willard A. Van Engel, article, Estuarine Bulletin, vol. 7, nos. 2 & 3, June 1963, pp. 15-23, illus., printed. University of Delaware, Department of Biological Sciences, Newark, Del. Covers the external structure of crab claws, normal regeneration of appendages, and types of claw deformities.

"Size Relations of Two Instars of the Blue Crab, Callinectes sapidus," by Albert V. Tyler and David G. Cargo, Contribution No. 227, article, Chesapeake Science, vol. 4, no. 1, March 1963, pp. 52-54, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

CRUSTACEA:
The East American Species of Gnathophyllum (Decapoda, Caridea), with the Description of a New Species, by Raymond B. Manning, Contribution No. 384, 17 pp., illus., printed. (Reprinted from Crustaceana, vol. 5, part 1, pp. 47-63. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla.

CUTTLEFISH:
"The Proteolytic Enzyme in the Liver of a Cuttlefish. I--Partial Purification and Some Enzymic Properties," by Sakari Nara (Hokkaido Gakugei University, Hakodate, Japan), article, Chemical Abstracts, vol. 55, October 2, 1961, 20239b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

DANISH SEINING:
"Danish Seining Pays off in Nova Scotia," by Frank Miller, article, Canadian Fishermen, vol. 50, January 1963, pp. 15, 17, printed. National Business Publications Ltd., Gardenvale, Que., Canada.

DECOMPOSITION:
"Chemical Indexes of Decomposition in Haddock Stored in Natural Ice and in Chlortetracycline (CTC) Ice," by Fred Hillig and others, article, Journal of the Association of Official Agricultural Chemists, vol. 45, November 1962, pp. 951-978, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Chemical Indexes of Decomposition in Perch Stored in Natural Ice and in Chlortetracycline (CTC) Ice," by Fred Hillig and others, article, Journal of the Association of Official Agricultural Chemists, vol. 45, November 1962, pp. 922-951, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Inhibition and Promotion of Post-Mortem Lipid Hydrolysis in the Flesh of Fish," by J. A. Lovern and June Olley, article, Journal of Food Science, vol. 27, November-December 1962, pp. 551-559, printed. Institute of Food Technologists, 510-522 North Hickory Street, Champaign, Ill.

"Post-Mortem Change of Fish Myosins. I--Some Physicochemical Changes with Special Reference to Species and Lethal Conditions of Fish," by Taneko Suzuki and Masao Migita, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 61-72, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Summary of Chemical Data on Progressive Decomposition Studies of Cod, Haddock, and Perch," by Fred Hillig, L. R. Shelton Jr., and J. H. Loughrey, article, Journal of the Association of Official Agricultural Chemists, vol. 45, August 1962, pp. 724-731, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

EAST AFRICA:
Preparing Shipments to East Africa, OBR-63-13, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., January 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report giving information on preparation of shipments to Kenya, Tanganyika, Uganda, and Zanzibar (formerly comprising British East Africa). Covers the preparation of shipping documents; information on labeling, marking, and packing; customs procedures; and related subjects.

ENZYMES:
"Enzymatic Studies on the Muscle of Aquatic Animals. IV--Limiting Step in Aerobic Fructose 1 Glycolysis and the Formation of a Glycerophosphate in Fish and Mollusk Muscle," by Takeshi Shibata and Katsuji Yoshimura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, May 1962, pp. 514-518, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

FATTY ACIDS:
"The Free Fatty Acids of Cod Oil. 1--Anomalous Composition by Fatty Acid Chain Length," by R. G. Ackman, R. D. Burgher, and M. L. Hughes, article, Journal of the Fisheries Research Board of Canada, vol. 19, November 1962, pp. 1081-1084, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

FISH CULTURE:
"Phosphates Boost Yield in Malayan Fish Ponds," article, New Scientist, vol. 16, November 1, 1962, p. 246, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

FISHERY STOCKS:
"K Metodike Issledovaniya Rannikh Stadii Promyslovykh Ryb" (A Method for Studying the Early Stages of Commercially Valuable Fishes), by A. S. Baranenkova, article, Biological Abstracts, vol. 40, no. 1, 1962, Abstract No. 390, printed. University of Pennsylvania, 3815 Walnut St., Philadelphia 4, Pa.

FISH MEAL:
"Devons-Nous Prevoir la Fabrication de Farine de Poisson a Bord de Nos Futurs Chalutiers?" (Must We Anticipate the Manufacture of Fish Meal Aboard Our Future Trawlers?), by R. Lenier, article, France Peche, no. 71, March 1963, pp. 15-17, printed in French. France Peche, Boite Postale 179, Lorient, France.

"Supplemental Value of Fish Meal Protein in Relation to Other Sources of Protein in the Test Diet," by H. N. Waterhouse and H. M. Scott, article, Poultry Science, vol. 41, November 1962, pp. 1936-1939, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

FISH METABOLISM:
"The Tricarboxylic Acid Cycle in Fish," by M. Gumbmann and A. L. Tappel, article, Archives of Biochemistry and Biophysics, vol. 98, August 1962, pp. 262-270, printed. Academic Press Inc., 111 5th Ave., New York 3, N. Y.

FISH POPULATIONS:
"O Prichinakh Flyuktuatsii Chislennosti Ryb.," (The Cause of Fluctuations in the Size of Fish Populations), by G. V. Nikol'skii, article, Voprosy Ikhtiologii, vol. 1, no. 4, 1961, pp. 659-665, printed in Russian. Akademia Nauk, SSSR., Ikhtiologicheskaia Komissaia, Moscow, U.S.S.R.

FISH PROTEIN CONCENTRATE:
"An Improved Method for the Preparation of Fish Protein Concentrate from Cod," by H. E. Power, article, Journal of the Fisheries Research Board of Canada, vol. 19, November 1962, pp. 1039-1045, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Performance of Rats Fed Fish Flour (Fish Protein Concentrate) or Casein as the Sole Source of Dietary Protein through Four Generations," by Harold E. Schendel and B. Connor Johnson, article, Journal of Nutrition, vol. 78, December 1962, pp. 457-460, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

FISH SCHOOLS:
"Vliyanie Vnutrennikh Prilivnykh Volna na Sutochnye Vertikal'nye Migratsii Morskikh Promyslovykh Ryb" (The Effect of Internal Tidal Waves on The Daily Vertical Migration of Commercial Fish), by V. R. Fuks, article, Biological Abstracts, vol. 39, no. 6, part 1, 1962, Abstract No. 21803, printed. University of Pennsylvania, 3815 Walnut St., Philadelphia 4, Pa.

FLORIDA:
(Florida State Board of Conservation, Division of Salt Water Fisheries) Fifteenth Biennial Report, 1961-1962, 17 pp., illus., printed. Division of Salt Water Fisheries, Florida State Board of Conservation, Tallahassee, Fla. Discusses fisheries problems arising from the population increase in Florida during 1961-1962 and measures used by the Division of Salt Water Fisheries to solve these problems. Outlines work done to improve the perennial problem of declining demand and consumption of mullet; reorganization of enforcement group; organization of the Florida Boating Safety Council; developments in the oyster industry; and changes in the shrimp industry. Summarizes research work conducted on spiny lobsters, canning of mullet (lisa), offshore fish parasites of shrimp, vitamin B_{12} in sea water (presumed precursor of red tide pollutions), ecology of Florida Bay and shrimp biology. Includes statements of expenditures, reports of arrests and disposition, records of permits issued, and other related data.

Summary of Florida Commercial Marine Landings, 1962, by Albert Rosen and Richard K. Robinson, 63-2, 19 pp., printed. The Marine Laboratory, Institute of

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla., April 1963. First of two parts. Contains tables of landings and values of fish and shellfish landed in Florida. Data are presented for each county in the State and summarized for the East Coast, West Coast and combined totals.

A Survey of Offshore Fishing in Florida, by Martin A. Moe, Jr., Professional Papers Series Number Four (also Florida State Board of Conservation, Marine Laboratory Contribution No. 72), 117 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla., January 1963. The purpose of this survey was to obtain data on the major offshore fishing activity in Florida waters. These data included: information on the offshore boat population; identification and determination of the seasonality and extent of development of the offshore fisheries of each coastal county; determination of the degree of exploitation of the major commercially valuable offshore fishes by sport and commercial fishing vessels throughout the State; and reports of various local conditions that affect the offshore fishing of each coastal county. This survey provides extensive background information that will be very useful in future research on the offshore reef fishes.

FOOD AND AGRICULTURE ORGANIZATION:

FAO Catalogue of Fisheries Publications and Documents, Supplement May 1962-February 1963 (Provisional edition), 8 pp., processed in English, French, and Spanish. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963.

Fisheries, by Klaus Sunnana, (Commission Paper WFC/63/CP/IC/2a, World Food Congress, Washington, D. C., June 4-18, 1963), 4 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. A paper, presented before the World Food Congress, which discusses a number of world-wide fishery economics problems. The fisheries may be of very great help in order to improve the food situation if the fisheries problems of all kinds are handled in the right way as a global problem in the future, states the author. The matter of conservation of marine resources in both the North Atlantic and North Pacific is of great concern to countries which fish in these areas. There is need for marine research and exploratory fishing in those areas as well as in tropical and Southern Hemisphere waters. The development of the fisheries in many newly-emerging countries should be based on fostering fish trades in the local markets as well as in foreign commerce. Introduction of cold storage and refrigerated transport facilities and the use of mechanized vessels and modern gear are also of great importance.

Increasing Food Production through Education, Research, and Extension, Freedom from Hunger Campaign Basic Study No. 9, 86 pp., illus., printed, $1. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963. (For sale in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

Marketing--Its Role in Increasing Productivity, Freedom from Hunger Campaign Basic Study No. 4, 127 pp., illus., printed, $1.50. Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy, 1962. (For sale in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

Nutrition and Working Efficiency, Freedom from Hunger Campaign Basic Study No. 5, 56 pp., illus., printed, 50 cents. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962. (For sale in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

Third World Food Survey, Freedom from Hunger Campaign Basic Study No. 11, 111 pp., printed, $1.50. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963. (For sale in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) Presents a comprehensive picture of the present and past world food situation. Based on food balance sheet data for over 80 countries covering 95 percent of the world's population. Also draws upon the food consumption and dietary surveys conducted in various parts of the world and introduces new statistical techniques in the study of food supplies and needs. Covers developments in the world food situation; levels, patterns, and trends of food consumption; and hunger and malnutrition. Also discusses nutritional targets, food supply targets, the size of future food needs, and the possibilities of producing the required food.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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Although of value to biologists in general, this book will be even more valuable to those with a general interest in marine biology. It is becoming more difficult to obtain a general picture of the over-all advances being made in our knowledge of the many aspects of life in the sea. Expansion of marine research in recent years and increased specialization have resulted in a mass of published results scattered through many periodicals and publications. Thus the summary articles planned for this annual serial book should help all those interested in the sea to keep abreast of current research.

The first article of this book is concerned with the rearing of bivalve mollusks. Included in the discussion are equipment needed, conditioning for out-of-season spawning, cultivation of eggs and larvae, and rearing of different species. The other articles included are: "The Breeding of the North Atlantic Freshwater Eels;" "Some Aspects of Photoreception and Vision in Fishes;" "The Biology of Coral Reefs;" and "The Behaviour and Physiology of Herring and other Clupeids." The book also contains an author and subject index.

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"Radiation Pasteurization with Cobalt 60 of Fresh Shrimp Prior to Freezing," by Arthur F. Novak, Joseph A. Liuzzo, and Lyle St. Amant, article, Quick Frozen Foods, vol. XXV, no. 11, June 1963, pp. 40-41, 140-142, 144, illus., printed. Quick Frozen Foods, 1776 Broadway, New York 19, N. Y. Describes the methods employed and results obtained in experiments conducted on the radiation pasteurization of shrimp. Fewer black spots, better taste and color resulted after three months' storage when shrimp were irradiated before freezing. According to the authors, "Low-dose radiation, pasteurization, does not produce a sterile product, but is capable of destroying approximately 90 percent of the microorganisms present in shrimp. The important factor is that few chemical changes occur, and the unaltered product is organoleptically acceptable after low dose radiation treatment." The authors point out that, "It must be emphasized that the procedures employed for obtaining fresh shrimp, the method of handling and storing, and the time of holding prior to irradiation are factors involved in ascertaining the keeping qualities after irradiation. Quality of shrimp is not improved by radiation pasteurization, and it should be understood that only products of high initial quality are likely to be preserved successfully."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BY OBTAINED FROM THE ORGANIZATION ISSUING THEM.

RADIOACTIVE ISOTOPES:

Special Sources of Information on Isotopes, TID-4563 (3rd Rev.), 99 pp., illus., processed. U. S. Atomic Energy Commission, Division of Isotopes Development, Washington 25, D. C., April 1962. Contains, among others, a list of reports on radiation preservation of foods.

RAYS:

"South by South-West--A Migration of Cownose Rays," by Paul W. Hess and Lee W. Miller, article, Estuarine Bulletin, vol. 7, nos. 2 & 3, June 1963, pp. 3-5, illus., printed. University of Delaware, Department of Biological Sciences, Newark, Del. A brief description of the migratory habits of some of the elasmobranch fish that enter the Delaware Bay, especially the cownose ray. The cownose ray is essentially a semitropical species, but during the summer it is found in many areas along the eastern coast of the United States, northward to Cape Cod.

REFRIGERATED SEA WATER:

"Developments in Refrigerated Sea-Water Fish-Holding," by M. Lorant, article, World Refrigeration, vol. 13, no. 7, July 1962, pp. 21-22, illus., printed. World Refrigeration and Air Conditioning, 1 Crane Ct., Fleet St., London EC4, England.

SALMON:

The Exploitation, Scientific Investigation and Management of Salmon (Genus ONCORHYNCHUS) Stocks on the Pacific Coast of Canada in Relation to the Abstention Provisions of the North Pacific Fisheries Convention, Bulletin No. 9, 112 pp., illus., printed. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver, B. C., Canada, 1962.

"Impaired Pigmentation in Chinook Salmon Fed Diets Deficient in Essential Fatty Acids," by Nicholas Nicholaidas, article, Journal of Nutrition, vol. 78, December 1962, pp. 431-437, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

"Muscle Proteins of Pacific Salmon Oncorhynchus. III - The Separation of Muscle Proteins Soluble in Low Ionic Strength Salt Solutions by Starch Gel Electrophoresis," by H. Tsuyuki, E. Roberts and R. E. A. Gadd, article, Canadian Journal of Biochemistry and Physiology, vol. 40, July 1962, pp. 929-936, printed. National Research Council, Ottawa, Canada.

Pink Salmon (ONCORHYNCHUS GORBUSCHA) in Northern Norway in the Year 1960 (Med et Norsk Resyme), by Magnus Berg. Scientia No. 17, 24 pp., illus., printed. Museum, Tromso, Norway, 1961.

Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1960, by Wilbur Church, Informational Leaflet No. 29, 14 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, June 18, 1963.

Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, Alaska, 1961, by Wilbur Church, Informational Leaflet No. 30, 23 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, June 20, 1963.

Salute to the Sockeye, 24 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminister, B. C., Canada, 1958.

"Testosterone, Conjugated and Free" in the Blood of Spawned Fraser River Sockeye Salmon (Oncorhyncus nerka), by Dov Grajcer and D. R. Idler, article, Canadian Journal of Biochemistry and Physiology, vol. 39, October 1961, pp. 1585-1593, printed. National Research Council, Sussex Street, Ottawa, Canada.

"In Vivo Metabolism of Steroid Hormones by Sockeye Salmon. (A) Impaired Hormone Clearance in Mature and Spawned Pacific Salmon (O. nerka); (B) Precursors of 11-Ketotestosterone," by D. R. Idler and B. Truscott, FRB No. 770, 13 pp., illus., printed. (Reprinted from Canadian Journal of Biochemistry and Physiology, vol. 41, 1963, pp. 875-887.) Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex Street, Ottawa, Canada.

SCOTLAND:

Scottish Fisheries Bulletin, No. 19, June 1963, 27 pp., illus., printed. Department of Agriculture and Fisheries for Scotland, Edinburg, Scotland. Includes, among others, the following articles: "Forecast for Scottish North Sea and West Coast Fisheries in 1963," by B. B. Parrish and A. Saville; "Measuring Seine Net Warp Tension," by W. Dickson and M. J. D. Mowat; "Decline in Scottish Turbot Landings," by Bennet B. Rae; "Fishing by 'Snella' (Hand-Reel)," by S. D. E. Devlin; "How to Distinguish Marketable from Non-Marketable Squid," by C. Davidson; "The Life History of Salmon," by K. A. Pyefinch; and "Pink-Fleshed Haddock," by B. B. Rae and R. Johnston.

SEA BASS:

"Status of the Cuban Serranid Fish, Paralabrax maculata," by C. Richard Robins and Walter A. Starck, II, Contribution No. 413, 1 p., printed. (Reprinted from Copeia, no. 4, December 31, 1962, p. 852.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SEA FLOOR:

"Three Dimensions on the Sea Floor," by Edwin C. Buffington and Carl J. Shipek, article, Sea Frontiers, vol. 9, no. 2, May 1963, pp. 78-84, illus., printed. The International Oceanographic Foundation, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

SEALS:

"Isolation of Five Myglobins From Seal," by Nevenka M. Rumen (Nobel Medical Institute, Stockholm, Sweden), article, Chemical Abstracts, vol. 56, April 2, 1962, 7669e, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

Seals of Arctic and Eastern Canada, by A. W. Mansfield, Bulletin No. 137, 36 pp., illus., printed, C$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1963. This bulletin is intended to provide a means of identifying the seals of arctic and eastern Canada, and a summary of the more important facts of their life histories. Most of the pinnipeds described have been actively exploited by man for many years. The harp and hooded seals, and the northern

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fur seal, support multimillion dollar industries. Discusses additional names, characteristics, reproduction, feeding, and distribution of the harbour seal, grey seal, harp seal, hooded seal, ringed seal, bearded seal, walrus, and northern fur seal.

SEA TROUT:
"Irish Sea Trout," by Arthur E. J. Went, article, Scientific Proceedings, series B. vol. 1, no. 10, 1962, pp. 265-296, illus., printed. Royal Dublin Society, Dublin, Ireland.

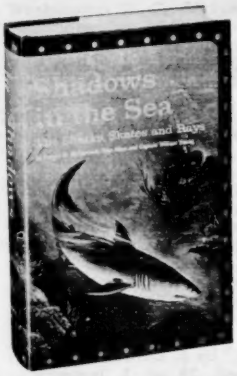
SEA URCHINS:
"The Deoxyribonucleoproteins of Sea Urchin Sperm Extraction and Analyses," by Luigi Messineo, article, Archives of Biochemistry and Biophysics, vol. 96, March 1962, pp. 479-485, printed. Academic Press Inc., 111 5th Ave., New York 3, N. Y.

SENEGAL:
Licensing and Exchange Controls of the Republic of Senegal, by R. K. Sherwood and D. Taher, OBR-63-37, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., March 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Senegal's import licensing and administration of exchange controls, and United States import and export controls.

SERRANID FISH:
The Fishes of the Western Atlantic Serranoid Genus GRAMMA, by James E. Bohlke and John E. Randall, 20 pp., illus., printed. (Reprinted from Proceedings of the Academy of Natural Sciences of Philadelphia, vol. 115, no. 2, May 10, 1963, pp. 33-52.) Academy of Natural Sciences of Philadelphia, 19th St. and the Parkway, Philadelphia 3, Pa.

SHARKS:
"The Dogfish--Plentiful, Palatable Pest," by Bernard L. Gordon, 2 pp., illus., printed. (Reprinted from Frontiers, June 1963, pp. 152-153.) Academy of Natural Sciences of Philadelphia, 19th St. and the Parkway, Philadelphia 3, Pa.

Shadows in the Sea (The Sharks, Skates and Rays), by Harold W. McCormick and Tom Allen with Captain William E. Young, 428 pp., illus., printed, $10. Chilton Books, 525 Locust St., Philadelphia 6, Pa., 1963. Man's fear of sharks and similar denizens of the sea goes back in time. In recent years, man's increased leisure time has resulted in the expansion of pleasure boating, aqualung diving, and increased marine research. But reports also have indicated an increase in frequency of shark attacks. However, this increase is believed to be based more on man's increased use of the sea rather than any increase in or a change in the habits of sharks. In turn, this has led to the asking of these questions: What sharks are dangerous? How dangerous? When, where, and under what conditions? How can man protect himself against them? These and many similar questions are answered by this new book. But covered in the book are more than just sharks--included are all of the Selachians (skates, sharks, sawfish--more than 600 known species). Shark meat is eaten by millions of people from England to Japan, but in general is not sought after by United States fishermen and rarely does it reach the American dinner table. Many species of sharks (and most skates and rays) are delicious if properly prepared and cooked. In addition to their use as food, almost every part of the shark's strange anatomy through the years has been used for some commercial, chemical, medical, or other purpose. Before the advent of synthetic vitamin A, the livers of certain sharks were the most important natural source of that vitamin. A chemical produced in the liver of the shark is being used by medical researchers in the study of cancer and heart disease.



The authors of the book have gathered material from all over the world and have included many little known facts about the sharks and their relatives. These animals are among the most adaptable and hardy forms of life on earth and have survived longer than most. Found all over the world from polar to equatorial seas, from shallow to deep waters, and from salt to fresh waters, their behavior toward man is unexplainable and still a mystery. In Part 1, the authors discuss shark against man. Part 2 concentrates on man against shark, and included is a chapter on attempted methods of preventing shark attacks, precautions advised, and official warnings. Part 3 is most fascinating--it discusses sharks and their relatives in mythology, legend, folklore, and crime; sharks as food for man; and commercial shark fishing and the products obtained from them. Part 4 concentrates on the origin of the sharks and their relatives, and includes chapters which describe many species with a list of the more common Selachians of North America. For those who would like to try shark meat as food, an appendix contains many recipes from shark chowder, shark patties, fried shark fillets, to shark a la newburg, fried skate, "the shark fin dish," shark fin soup, and others. Anyone interested in fishing, fisheries, the sea, and marine research will find the book invaluable, but it is also a book for the general reader because it is written in a readable style and is full of general information. Included is a good index and an adequate bibliography.

--Joseph Pileggi

SHELLFISH:
"The Prevention of Yellow Discoloration of Shellfish, Especially of Frozen Scallop Ligament," by Yasuhiko Tsuchiya and others (Tohoku University, Sendai, Japan), article, Chemical Abstracts, vol. 56, June 11, 1962, 14676f, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SOUTH AFRICA REPUBLIC:
Licensing and Exchange Controls--Republic of South Africa, OBR-63-86, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., March 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Contains information on the import and export control

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systems of South Africa, and United States import and export controls.

SOUTH CAROLINA:
A Contribution to the Biology of the King Whitings, Genus MENTICIRRHUS, of South Carolina, by Charles M. Bearden, Contributions from Bears Bluff Laboratories No. 38, 25 pp., illus., printed. Bears Bluff Laboratories, Wadmalaw Island, S. C., June 1963.

SPAIN:
"Estudio sobre la Flota Pesquera Espanola y el Personal Empleado en la Misma" (Study of the Spanish Fishery Fleet and the Personnel Employed in It), article, Boletin de Informacion del Sindicato Nacional de la Pesca, no. 54, March 1963, pp. 13-17, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, Madrid, Spain.

SPINY LOBSTER:
"The Freezing of Crustacea," by J. Deniel, article, Revue Generale du Froid, vol. 39, no. 1, January 1962, pp. 33-37, printed in French. Association Francaise du Froid, 29 Blvd. St. Germain, Paris (5e), France.

SPOILAGE:
"Biochemical and Nutritional Studies on East Pakistan Fish. I--The Applicability of an Improved Iodine Absorption and Titratable Acidity Measurement to Investigate Fish Spoilage," by M. Qudrat-i-Khuda, H. N. De, and J. C. Debnath, article, Chemical Abstracts, vol. 55, June 12, 1961, 11696c, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SQUID:
"Giant Squid," by H. J. Turner, article, Oceanus, vol. IX, no. 4, June 1963, pp. 22-24, illus., printed. Woods Hole Oceanographic Institution, Woods Hole, Mass.

ST. PIERRE AND MIQUELON:
"Saint-Pierre et Miquelon dans le Marche Francais des Produits Surgeles" (Saint Pierre and Miquelon in the French Market for Deep Frozen Products), by Henri Claireaux, article, France Peche, no. 71, March 1963, pp. 36-38, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

TAIWAN:
Study on the Fishes From Ma-Kung, Pescadores Islands (Penghu), Taiwan, by Wen-Kuang Liaw, Report No. 13, 26 pp., illus., printed in Chinese. Taiwan Fisheries Research Institute, Taipei, Taiwan, 1960.

TARIFFS:
Tariff Schedules of the United States, Annotated, 1963, TC Publication 103, 622 pp., printed, $5 (includes supplementary material for an indefinite period). United States Tariff Commission, Washington, D. C., August 1, 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Tariff Schedules of the United States, Annotated, 1963, will become effective on August 31. The new Schedules will simplify the determination and application of U. S. import duties. They will thus benefit domestic producers, who will have more dependable knowledge of the rates of duty applying to the types of products they sell and the materials they buy. The Schedules will also benefit importers and consumers. Entry into force of the new Schedules has been approved by the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) and by the countries with which the United States still maintains bilateral trade agreements. Include duties on fish and shellfish, other fishery products and byproducts, and products used by and of interest to the fishing industry.

TRADE LISTS:
The U. S. Department of Commerce has published the following trade lists. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at $1 each.

Canneries and Frozen Foods--Producers and Exporters--Venezuela, 9 pp., April 1963. It lists the names and addresses, size of firms, and types of products (including shrimp, sardines, tuna, and fish paste) handled by each firm.

Oils (Animal, Fish, and Vegetable)--Importers, Dealers, Producers, Refiners, Exporters--Morocco, 4 pp., April 1963. Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish and whale oils.

TRANSPORTATION:
"Present Status of Refrigeration Trucking in Japan," by M. Izawa, article, Bulletin of the International Institute of Refrigeration, vol. XLIII, no. 1, 1963, pp. 36-47, printed. Institut International du Froid, 177, Boulevard Malesherbes, Paris (17e), France.

TUNA:
"Considerations Pratiques sur le Verdissement du Thon Tropical" (Practical Observations on Occurrence of Green Meat of Tropical Tuna), by J. F. Aldrin, article, Revue de la Conserve, vol. 17, no. 7, September-October 1962, pp. 147-151, illus., printed in French. Revue de la Conserve, 1 Rue de la Reale, Paris 1, France.

F.R.V. "Derwent Hunter," Report 33, 63 pp., illus., processed. Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography, Marine Biological Laboratory, Cronulla, Sydney, Australia, 1963. Discusses 9 cruises by this fishery research vessel during 1959 and 1960. These cruises were planned for tuna exploration in a wide area of southeast Australian waters. The objective was to determine any association that might exist between the distribution of southern bluefin tuna (Thunnus maccoyii) and the type of water in which they were caught. For these investigations a tuna long-line was designed and assembled. The details of this gear are given in the first section of this report. A short summary follows of the length frequency data of the southern bluefin caught on these cruises, and the relation between tuna and water conditions. In the final section the hydrology and tuna long-lining results of four of the cruises are given.

"Keeping Flesh Color of Tuna and Yellowtail," by Michinori Yamaga, Kazuma Morioka, and Takeo Kawakami (Taiyo Fishery Co., Shimonoseki, Japan),

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article, Chemical Abstracts, vol. 56, April 2, 1962, 7758d, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"New England Tuna--A Bright New Industry?" article, Fishing Gazette, vol. 79, December 1962, pp. 12-13, printed. Fishing Gazette Publishing Corp., 461 8th Ave., New York 1, N. Y.

"Packing Tuna in the U. S.," by R. Finch, article, Fishing News International, vol. 1, no. 4, July 1962, illus., printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

TUNA SEINERS:
"Hornet--1962 Tuna Seiner Prototype in Steel," article, Pacific Fisherman, vol. 60, December 1962, pp. 13-15, 17, 19, printed. Miller Freeman Publications, 71 Columbia St., Seattle 4, Wash.

TUNISIA:
Preparing Shipments to Tunisia, by M. E. Jeneid, OBR-63-83, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., April 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents information on shipping documents; labeling, marking, and packing; entry, transit, and warehousing; customs procedures; and related subjects.

TURKEY:
Balik ve Balikcilik, vol. XI, nos. 5-6, May-June 1963, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik, Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Place of the Fisheries in the Five Year Development Plan," "Spiny Lobster," and "Cautions Delaying the Oxidation and the Rancidity of Fish Oil. Antioxidizable Elements and Their Use."

URUGUAY:
Revista del Instituto de Investigaciones Pesqueras (Journal of the Institute of Fisheries Research), vol. 1, no. 2, 1962, 115 pp., illus., printed in Spanish with summaries in French and English. Instituto de Investigaciones Pesqueras, Facultad de Veterinaria, Alberto Lasplaces, 1550, Montevideo, Uruguay.

UTAH:
Fishes of Utah, by William F. Sigler and Robert Rush Miller, 203 pp., illus., printed, paperback edition $1.25, cloth-bound edition $2.25. Utah State Department of Fish and Game, 1596 W. North Temple, Salt Lake City, Utah. Presents interestingly written chapters on sport fishing in Utah, the history of Utah fisheries, and the life histories of the fish species found in the State. Also contains an annotated checklist and keys to the fishes of Utah, a glossary of technical terms, aids to fish identification, artificial key to the families and subfamilies, keys to the species, a list of unsuccessful introductions of fishes into Utah waters, and a list of hybrids found in State waters. A nationally known artist has illustrated, in color, 19 game fish species. In addition each of the 40 fish species is illustrated in black and white.

VENEZUELA:
Licensing and Exchange Controls of Venezuela, OBR-63-80, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., March 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Venezuela's quantitative restrictions on imports, method of payment and receipt of foreign exchange, and United States import and export controls.

VESSELS:
"Fiberglass in Fishing Vessels," by Hugh McQuillan, article, Western Fisheries, vol. 65, November 1962, pp. 16-19, printed. Roy Wrigley Publications Ltd., 1104 Hornby St., Vancouver 1, B. C., Canada.

"New Trends in Construction of Polish Fishing Vessels," by J. Swiecicki and D. Bogucki, article, Fishing News International, vol. 1, no. 4, July 1962, pp. 51-56, illus., printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

VITAMIN A:
"Extracting Vitamin A from Natural Oils," by Frank J. Servigne, article, Chemical Abstracts, vol. 57, July 23, 1962, 2345c, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

WHALES:
The Scientific Reports of the Whales Research Institute, no. 17, 206 pp., illus., printed. Whales Research Institute, Geirui Kenkyusho, 12-4 Tsukishima-Nishigashi-dori, Chuo-ku, Tokyo, Japan. Includes, among others, articles on: "Oceanography and Whaling Ground in the Subarctic Region of the Pacific Ocean," by K. Nasu; "Studies on the Oil of Black Right Whale in the Northern Pacific Ocean," by H. Tsuyuki and U. Naruse; and "A Preliminary Study on Method of Time Marking with Lead-Salt and Tetracycline on the Teeth of Northern Fur Seal," by T. Yagi, M. Nishiwaki, and M. Nakajima.

Whales (The Biology of the Cetaceans), by E. J. Slijper, translated by A. J. Pomerans, 475 pp., illus., printed, $12.50. Basic Books, 404 Park Ave. S., New York 16, N. Y., 1962. Whales and whaling are not something that belong to the nineteenth century--they are just as active a subject today. About 40,000 of these useful mammals are being taken each year, mostly in the Antarctic. Whales, the giants of the animal kingdom, have been an interesting and romantic subject for centuries. The author, a Dutch anatomist and representative of the Netherlands at meetings of the International Whaling Commission and its scientific subcommittee, tells the whole remarkable story of whales. A revised translation of the author's Dutch Walvissen (1958), this book records the great advances in whale biology during the past 50 years. The development of modern whaling methods has posed problems of applied biology which could only be solved by international investigations.

The author in the preface points out that a keener interest by laymen (particularly coast-dwellers) in whales and dolphins will lead to more detailed study of these mammals because those people will be in a better position to study and observe than many an expert. In this book the author has concentrated on whale physiology, anatomy, and behavior. After an interesting historical introduction, the author describes the whales' evolution and external appearances; locomotion and locomotory organs; respira-

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tion; heart, circulation, and blood; behavior; hearing; production of sounds; and the senses and central nervous system. Then the author discusses feeding, metabolism, and presents a challenging chapter on the future of whales and whaling. Classification of Cetacea, a bibliography, names of Cetaceans in different languages, and an index complete the book. It is not addressed to the expert alone, but aims to interest the widest possible circle of readers in the life of animals which through the centuries have captured the imagination of mankind.

-- Joseph Pileggi

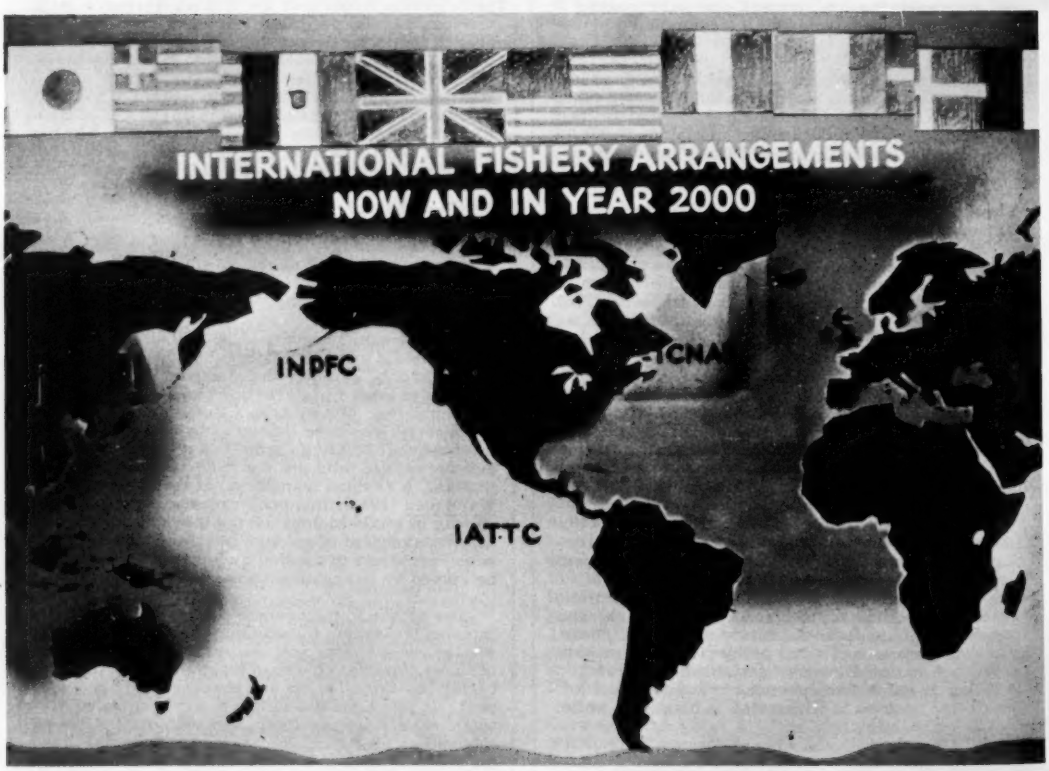
"Why Do Whales Become Stranded?" by William M. Stephens, article, Sea Frontiers, vol. 9, no. 2, May 1963, pp. 69-76, illus., printed. The International Oceanographic Foundation, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

WHALING:

"Determination of the Time Required for Freezing Whalemeat," by K. Tanaka and J. Nishimoto, article, Journal of the Tokyo University of Fisheries, vol. 47, no. 1, September 1960, pp. 81-92, printed. Tokyo University of Fisheries, Shiba-Kaigandori, 6-Chome, Minato-Ku, Tokyo, Japan.

YEASTS:

"Yeasts in Marine Environments," by J. W. Fell and N. van Uden, Contribution No. 370, 12 pp., illus., printed. (Reprinted from Symposium on Marine Microbiology, pp. 329-340.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.



CHESAPEAKE SEAFOOD SPECIALTIES

The culinary fame of Chesapeake Bay is achieved not only by the preparation and blending of its dishes, but by the great variety of flavorful foods which come from the cool waters of the Chesapeake. This aquatic assortment alone is enough to excite the most blase gourmet. No doubt about it, Maryland cooks really have a way with seafoods.

Succulent oysters only hours away from the salty waters of the Chesapeake; meaty blue crabs, dotted with pepper and steamed to a fiery red; firm-fleshed rockfish, glistening fresh from blue Bay waters to arouse arrested appetites; and the newest product from the Bay to pamper pallid palates, the Chesapeake soft shell clam, delightfully different in dozens of dishes.

About the turn of the century, Diamond Jim Brady in his numerous travels, would have fresh Chesapeake oysters in the shell shipped to him wherever he was lodged. Today, thanks to high speed transportation, fresh-out-of-the-water seafoods are rushed overnight to restaurants, seafood markets, and retail markets throughout the country.

DEVILED CRAB

1 pound blue crab meat	½ teaspoon salt
2 tablespoons chopped onion	3 drops tabasco
2 tablespoons melted fat or oil	Dash pepper
2 tablespoons flour	Dash cayenne pepper
¾ cup milk	1 egg, beaten
1 tablespoon lemon juice	1 tablespoon chopped parsley
1½ teaspoons powdered mustard	1 tablespoon melted fat or oil
1 teaspoon Worcestershire sauce	¼ cup dry bread crumbs

Remove any shell or cartilage from crab meat. Cook onion in fat until tender. Blend in flour. Add milk gradually and cook until thick, stirring constantly. Add lemon juice and seasonings. Stir a little of the hot sauce into the egg; add to remaining sauce, stirring constantly. Add parsley and crab meat; blend well. Place in 6 well-greased, individual shells or 5-ounce custard cups. Combine fat and crumbs; sprinkle over top of each shell. Bake in a moderate oven, 350° F., for 20 to 25 minutes or until brown. Serves 6.

In "Chespeake Seafood Specialties," a Fisheries Marketing Bulletin, home economists from the Bureau of Commercial Fisheries have selected 16 tidewater recipes for your eating enjoyment. Now the American housewife can add the salty flavor of the Chesapeake to her table in a variety of wonderful Bay ways. This publication is available free upon request from the U. S. Department of the Interior, Fish and Wildlife Service, Branch of Marketing, Washington, D. C. 20240.

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